a journal for precision engineers and all users of industrial diamonds and other hard materials

INDUSTRIAL DIAMOND REVIEW

incorporating INDUSTRIAL DIAMOND ABSTRACTS

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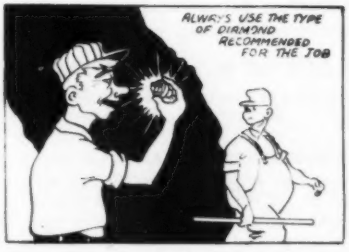

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Chapter 6—Grinding and Polishing Diamond.
Chapter 7—Drilling and Boring Holes.
Chapter 8—Carving and Engraving.
Chapter 9—Diamond Powder—Its Production and Use.
Chapter 10—Polishing Gem Stones for Jewellery.
Chapter 11—Manufacture of Watch and Instrument Jewels.
Chapter 12—Manufacture of Diamond and Sintered Carbide Dies.
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Chapter 14—Setting Diamonds in Tools.
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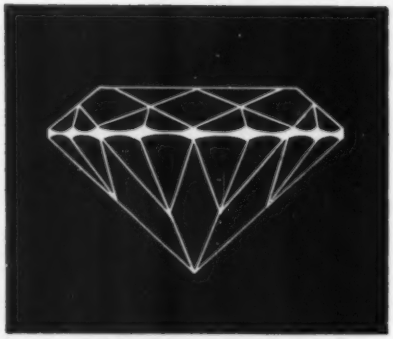

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INDUSTRIAL DIAMOND REVIEW

Vol 20 No 236
July 1960

Editor-in-Chief :
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Generally Speaking

International Machine Tool Exhibition

This was the first major machine tool exhibition in this country for a few years and as such we hoped that there would be a great deal of material on display to interest us. This hope was fully realized by the large variety of products which directly or indirectly incorporate industrial diamonds. After all, most precision grinders now are fitted at some time with diamond wheels, depending on the job being done, and wheel forming machines all use diamond points as do a host of others. Indeed the ways in which diamonds are used to achieve greater speeds and finer limits of precision and at less cost seem almost endless, and the exhibitors were keen to demonstrate or provide information about their many developments and refinements in this field. This month we have attempted to review some of the more interesting items, in particular those most specifically connected with diamonds. To have attempted a more comprehensive report and included everything of interest would have taken time equal to the exhibition itself.

Helping the User

An enterprising Continental manufacturer of diamond tools recently brought a large number of his customers in the Italian quarrying industry by chartered aircraft to his headquarters for a period of several days and gave them the opportunity of seeing all latest developments both in the manufacture of the type of diamond tools in which they were interested and of the machines on which they can be mounted for use. In this way not only were closer and more friendly relations between manufacturer and user established, but also the user was able to see the latest methods in use and the research which is being undertaken to introduce diamond tooling.

ADAMANT.

International Machine Tool Exhibition

by a Special Correspondent

The most recent of the International Machine Tool Exhibitions, arranged at four yearly intervals by The Machine Tool Trades Association of Great Britain, has just ended, on July 8, at Olympia, in London. Every conceivable type of machine and hand tool capable of tackling any problem likely to arise on the factory floor was exhibited; world shattering developments were non existent although many manufacturers had kept some refinements up their sleeves for the occasion.

Firms showing diamond tools and powders numbered seven, according to the very comprehensive catalogue, but there were others producing equipment suitable for use with diamond products.

Diamond Tool and Products

L. M. Van Moppes (Diamond Tools) Ltd: This firm took the opportunity to introduce the Diaform wheel forming attachment; known as the Diaform Model 12, this machine has been developed for use on large cylindrical grinders, centreless grinders, thread grinders and other special purpose machines. Three variations are included in the range and they are :—Model 12/1, taking an 18 in. diameter grinding wheel 1 in. wide; pantograph reduction is 10 × 1 and the maximum profile obtainable 1 in. wide by ½ in. deep. Model 12/2 takes a 29 in. diameter by 2 in. wide wheel, has a 5 × 1 pantograph reduction 12/4 takes a 24 in. diameter wheel 4 in. wide, has a pantograph reduction of 5 × 1 and produces a profile 1½ in. deep by four in. wide. The firm also showed its ranges of Diatru and Diatipt abrasive wheel truing and forming tools with single diamonds, multi-diamond truing tools and drilling bits, and samples of pure diamond powder in its various grades.

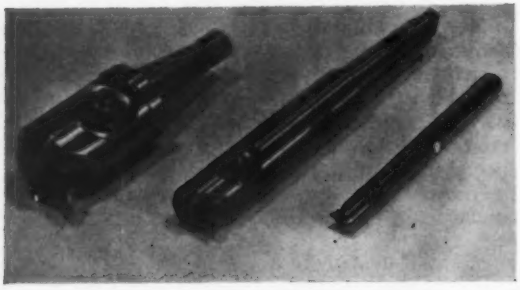

Fig 1. Diatipt boring tools in various types of mount (L. M. Van Moppes).

A. Shaw & Sons (Diamonds) Ltd.: Established in 1815, when Joshua Shaw invented the glaziers' diamond, this firm claims it is the only one in the British Isles offering every type of cutting device required by the glass industry. New in its range of peripheral wheels is a 16 in. diameter by ½ in. wide metal bonded specimen, reputed to be the largest diameter of its type yet produced. In addition to its ranges of peripheral, small internal grinding peripheral, chip breaker, cut-off, straight cup, double cup, ring cup and a number of other shaped wheels this firm produces single and multi-diamond wheel dressing tools, turning and boring tools, indenters for hardness testing machines, engraving points, grooving points, thread grinding tools and diamond contacts for gauges. Glaziers' diamonds are still being produced and have changed little in design since first introduced. A live demonstration of ceramic grinding was being carried out on the stand, ceramic machining being one of the fields in which the firm specialises.

Universal Grinding Wheel Co. Ltd.: Three types of bond, resinoid, metal and vitrified, are available in the diamond grinding wheels produced by this firm; grain sizes range from 46 to 500 although the most commonly used, in resinoid wheels, are, 100, 150, 220, 280, 320 and 400 (the higher the number the finer the grain). The diamond concentration in this bond is numbered 25 (open), 50 and 100 (close). The commonest sizes in the metal bond are 60, 80, 100, 150, 180, 240 and 280, and diamond concentration 50, 75 (medium), and 100. A somewhat coarser finish is obtained from vitrified bonded products which have grain sizes of 100, 150, 220, 280, 320 and 400 and a similar concentration to resinoid bonded wheels. A fourth range of products is known as electrometallic mounted, the diamond grains being fixed to the working surface of the tools by an electrolytic process.

Apart from its made up tools the firm also supplies Unidiamond grain and powder, sizes for grain ranging from 550—50 micron and for powder from 42 to ¼ micron.

The Carborundum Company Ltd.: The diamond products from this company are resinoid or metal bonded and supplied in 18 different grit sizes, from 24 to 800, concentrations ranging from 1 (low) to 8 (high). Under the name of Carbolap the firm has produced a 6 in. diameter wheel, 1 in. thick and with a ¾ in. rim; depth of abrasive coating is ¼ in. This wheel is designed for off-hand lapping of all classes of cutting tools and tool materials. A set of hand hones is also produced in the same material in four grit sizes, 180 (for tungsten carbide tools over ¾ in. section), 220 (for tungsten carbide tools ⅜ — ¾ in. section), 360 (for all other materials and tungsten carbide tools under ⅜ in. section) and 500 (for super finishing after using other grits). Although some manufacturers are producing a range of throw away ceramic tool bits they all say that unless machines are produced with high speeds coupled with high horse-power full satisfaction cannot be obtained from these bits. A range of these tool inserts in various sections is being manufactured by this firm for turning tools and milling cutters.

Fig 2. The Vandia radiusing fixture in use (S. L. Van Moppes).

S. L. Van Moppes Ltd.: Most recently developed by this firm is the "Vandia" grinding-wheel radiusing fixture. Maximum male radius generated with this tool is 0 — ¾ in. and female, ¼ — 3 in. with up to 9 in. diameter wheel.

Samuel Osborn & Co. Ltd. are the distributors for "Lazmet Diard" Long Life grinding wheel dressers; these come in four types, D.1., ⅜ in. in diameter with ¼ in. impregnation, D.2., ¾ in. in diameter with ¼ in. impregnation, F.1., ½ in. square with ⅞ in. impregnation and F.2., 3/16 in. square and ⅞ in. impregnation. All of these tools are on ½ in. diameter shanks, with the exception of F.1. which is on ⅜ in. diameter, 6 in. long. The firm also distributes "Diard," boron carbide plus diamond impregnated hand laps for maintaining the cutting edges of carbide and other hard metal tools.

Norton Grinding Wheel Company Limited: A range of resinoid, vitrified or metal bonded diamond wheels are marketed by this firm for both wet and dry grinding. In certain cases SD man-made diamonds are being used in vitrified and resinoid bonded wheels.

Fig 3. The X-17 diamond paste kit (Charles Churchill & Co Ltd).

Charles Churchill and Co. Limited: A diamond paste, known as X-17 and manufactured by a Swiss firm, is distributed by this firm; packed in 5 gram glass syringes it is obtainable in 12 different grain sizes, 0.1, 0.25, 1, 3, 6, 8, 16, 25, 40, 60, 80 and 100 microns; complete kits can be supplied with the required range of grain sizes. The Cgm Tip Tool is another product of which this firm are distributors. This tool has 10 different shapes of shanks, left and right handed; these take round, square or triangular precision ground or semi-finished carbide tips. The object of this range is to eliminate grinding, the operator just turning the bit round until a new edge is presented to the workpiece, each bit having from 6 to 8 positions.

Luke & Spencer Ltd.: "Lukspenite," "Borolite" and "Vitramic" are the trade names of the various products put out by this firm; the first denotes wheels with shellac, rubber or silicate bonds, the second covers resinoid bonds and the third, bonds made by the vitrified process. Only three main abrasives are employed, regular aluminium oxide, white aluminium oxide and silicon carbide. Beside supplying a large variety of wheels the firm also has a large range of sticks in square, triangular, half round or round sections.

Cutting Tools and Materials in Tungsten Carbide

Murex Limited: This firm manufactures a complete range of cemented tungsten carbide products for all industries. A new introduction is the Mark II "Futurmill," a range of face milling cutters. All rake and clearance angles are included in the cutter body rather than grinding them on to the cutter blades which are symmetrical polygons of solid tungsten carbide, each of which can be indexed to present a new cutting edge, thus avoiding the necessity of cutter grinding. Other products in this firm's ranges include I.S.O. standard tool tips, many different shapes and sizes of tungsten carbide burs, dies, pellets and tools, tube drawing plugs, wire drawing dies, tube and bar drawing dies, hexagon, square, flat and other solid shape dies, and saws—up to 24 in. in diameter, all from cemented tungsten carbide. The Metallurgy Division of this firm is one of very few producing tools of this calibre through all the stages from the raw material.

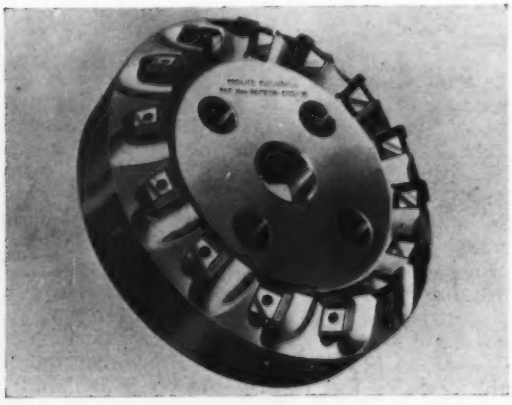

Fig 4. A Mk II 'Futurmill' (Murex Ltd).

Firth Brown Tools Ltd.: This firm manufactures a wide range of tungsten carbide tools under the "Mitia" trade mark; from this range is the Type 3 face milling cutter with inserted blades. This cutter can be fitted with any of three sets of blades suitable for cast iron, bronze and brass, light alloys and copper, and steel. Each set, too, can be supplied for left or right-hand cutting. The correct cutting rakes are ground on the blades as all tool slots are at right angles to the body face. For regrinding these cutters—and precision is essential—the manufacturers specify that only diamond wheels be used. Cutter diameters range from 4 to 18 in. by 2 in. steps.

Richard Lloyd Limited: A complete range of cemented carbide and serrated, removable, tipped tools are manufactured by this firm under the "Galtona" trade mark. For these serrated blades it is claimed that when redressing is necessary they can be advanced by one slot, a matter of a few thousandths of an in., enabling resizing to be carried out with the minimum of grinding.

Edibrac Ltd.: The new "Standarfour" range of tipped cutting tools for turning were introduced at the Exhibition by this firm. Four tools, each of which is available in four sizes, make up this range of 16 tools which includes cranked, round nose, turning, bar turning, turning and facing, and cranked, turning and facing tools. Also in the ranges of this firm is the "Helliform" screwcutting tool, a circular tungsten carbide tip bolted to an angled shank so set that the helix angle for the particular thread being cut is automatically produced.

Edgar Allen & Co. Ltd.: Sintered products for a wide range of applications are produced by this firm and these include tools and tips for high speed machining and tips for press tools. Special alloy tool steels, including a complete range for the plastics industry, are also produced. The Athyweld process of deposit welding high speed steel to base metal shanks has been developed over a number of years and many tipped edge forms can be produced by this method. Repairs to existing tools can also be effected by the same process.

Machines and Instruments

Rubert & Co. Ltd.: A surface roughness indicator consisting of a sensing head in the form of a pivoted wheel connected to a dial indicator, for general workshop use, has been introduced by this firm and works in the following described manner :—The sensing wheel is moved repeatedly to and fro across the surface being measured,

friction between the work surface and the sensing wheel causes the wheel to rotate moving the pointer over the scale and tensioning a retaining spring until the spring tension balances the frictional drag and the wheel ceases to rotate. The indicator reading, retained by a ratchet, is then read directly from the dial which can be calibrated in CLA (the British and American standard of roughness evaluation), maximal depth or any other standard. Before a further reading can be taken the indicator has to be zeroed, slight finger pressure releasing the ratchet.

W. J. Meddings Ltd. : Known in dentistry for some little while, the Borden " Airotor," with a spindle speed of 300,000 revolutions per minute, has taken much of the inconvenience out of teeth drilling and has given the operator a much greater control over the hole being drilled. Until now, however, this machine was not available for other purposes, but Ashcombe's of New York have adapted it for an inconceivable number of machine shop uses where high speed cutting is necessary. All moving parts of the machine are contained in a replaceable cartridge $\frac{1}{4}$ in. long by $\frac{3}{8}$ in. in diameter, overall length with bur, either tungsten carbide or diamond is $\frac{7}{8}$ in., although, this can be reduced to $\frac{5}{8}$ in.

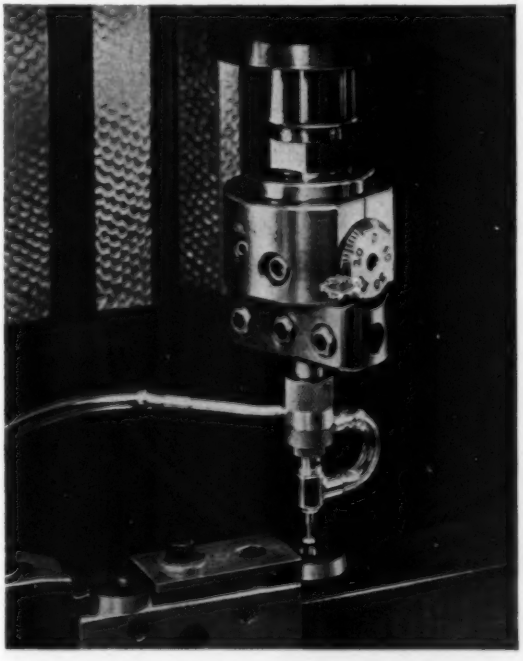

Fig 5. The 'Airotor' in one of its special mounts (W. J. Meddings Ltd).

A control unit supplies air to the head up to 2 cfm at 40 psi and can be attached to standard shop air-lines at pressures of 40 to 125 psi. The Ashcombe "Airotor" is marketed by W. J. Meddings, Ltd.

Fig 6. The 'Diprofil' in use finishing a die (Brooks & Walker Ltd).

Brooks & Walker Ltd. are the sole concessionaires in Great Britain for the "Diprofil", a hand machine weighing less than a pound which can be used for workshop operations requiring both reciprocating and rotary motions. A complete range of holders and diamond impregnated files, hones and other tools enable it to be used for filing, lapping, scraping, grinding, honing, polishing, milling, engraving, and sawing. A small attachment changes the tool from a reciprocating to a rotary one. This handy little tool has been on the market for some time but it is constantly being improved by additions to its range of attachments and tools.

The Gear Grinding Co. Ltd.: The latest form of single diamond root trimmer is incorporated in the most recently produced model, the G.A.7 of the "Orcutt" automatic spur tooth gear grinding machine. The arm in which the diamond is mounted is free to rotate in bearings in its housing in a horizontal carriage. Rack teeth in the piston rod of a hydraulic cylinder engage in a gear on the diamond and traverse the carriage. Micrometer stops are provided to control both the horizontal movement of the

carriage and the arc of the diamond arm at both ends of the stroke. The manufacturers claim that with this new refinement it is possible to control the complete generation of root form and its blend into the involute form on the grinding wheel with great accuracy.

Adam Machine Equipment Ltd. : For burnishing pivots for watches, clocks, dial gauges, meters, and instrument mechanisms, Strausak Cie make the Duplex pivot burnishing machine. Both ends of a pivot can be burnished simultaneously by it, the operator simply dropping the part on to a pair of notched feed discs. Burnishing is carried out by fully adjustable tungsten carbide laps which are so arranged that conical pivots, or pivots with a different diameter at either end can be handled. Pivot diameters from 0.002 in. to 0.059 in., with a pinion length up to $1\frac{3}{16}$ in. can be accommodated. Adam's are the sole UK agents.

W. & T. Avery Ltd. : A wide range of balances and testing machines are manufactured by this firm including a number of direct reading hardness testing machines for hard material to Rockwell, Brinell, and Diamond Pyramid standards.

Coventry Gauge & Tool Co. Ltd. : Among the wide range of "Matrix" grinding machines exhibited by this firm was the No. 56, high precision jig grinding machine. The spindle of the standard model has speeds ranging from 10,000 to 40,000 rpm; an alternative spindle unit is available giving speeds from 50,000 to 80,000 rpm. A collet nose enables diamond impregnated stalks to be used, or grinding spindle quills. All the controls for power operating are placed in the front for easy access. Hand controls are used for final setting to clearly defined dials, protected from dust and dirt by armour plate glass panels. Accuracy of table settings is guaranteed to 0.0001 in. (0.0025 mm).

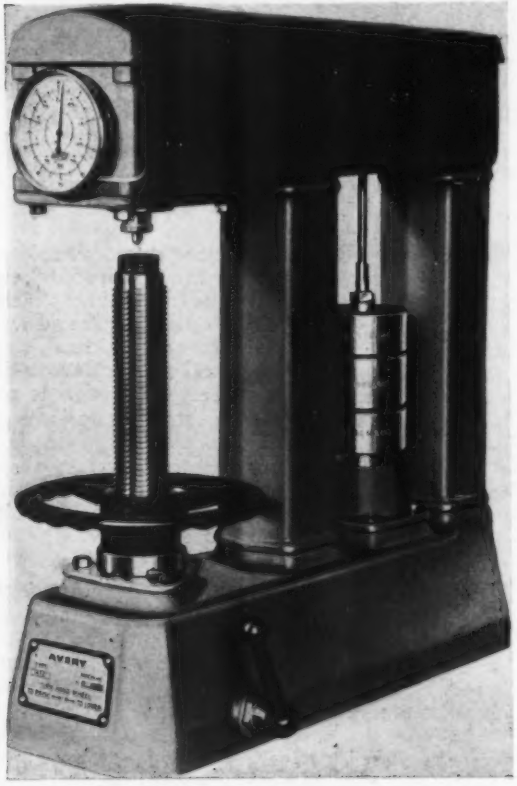

Fig 7. One of the range of hardness testing machines by W. & T. Avery Ltd.

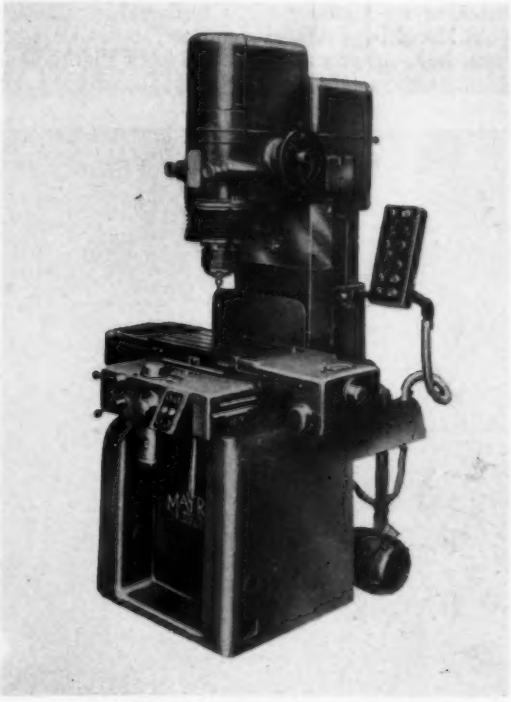

Fig 8. A Matrix grinding machine (Coventry Gauge & Tool Co Ltd).

Continued on p. 132

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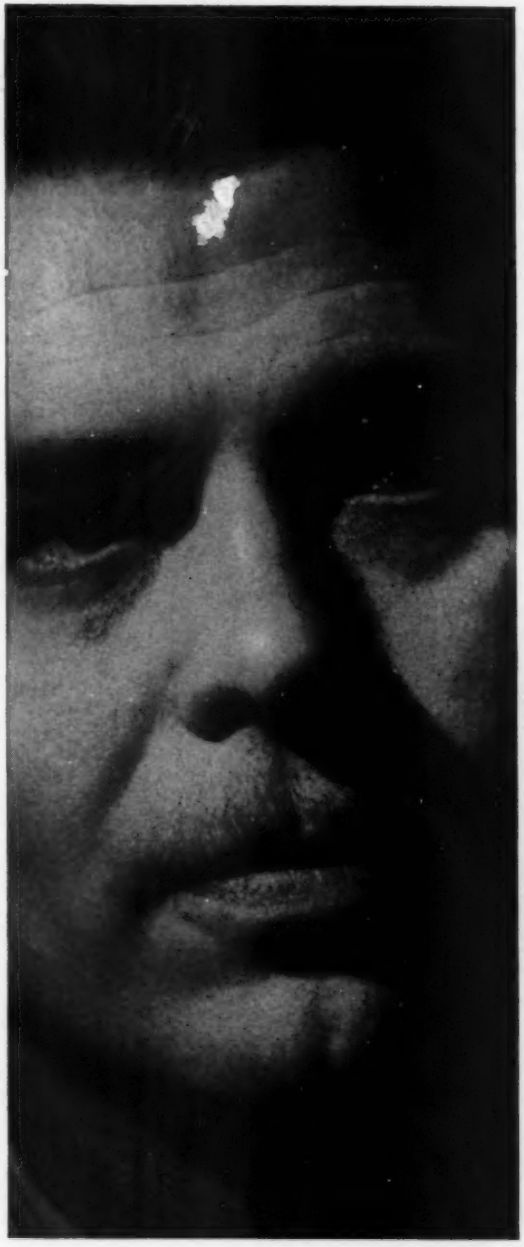
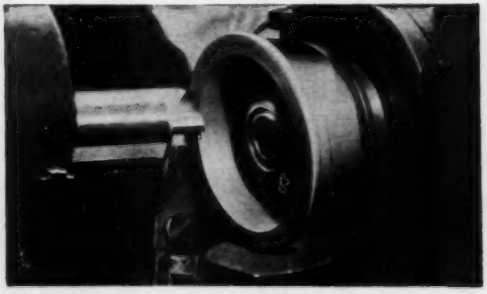


"We get more jobs out of each wheel with these" says **Tom Swain**

Tom Swain is the charge-hand of the cutter-grinding shop of Jonas & Colver (Tools) Limited. Most of the tools they grind there go to the motor industry or the aircraft industry. Among the most successful production tools that Tom's men use are the resin-bonded diamond wheels made by CARBORUNDUM shown in our smaller illustration. 'We find we get more jobs out of each wheel with these.' Tom says, 'And that's important with diamond wheels. Diamonds cost money!' He might have added that long wheel-life saves time spent in wheel changing, and so increases the production rate—not a big increase, but worth something in the course of a year.



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Delapena and Sons Limited (Honing Division)

The honing process has been developed by Delapena & Sons Ltd in the last few years and much progress has been made in automatic sizing methods. The new equipment, which is being shown for the first time at the International Machine Tool Exhibition at Olympia (see illustrations) incorporates a new method of automatic air gauging, using clean, dry, compressed air at between 50 and 150 lb/ in such as is obtained from a normal factory supply. An electrical mains supply at 230/250 volts, or 110/115 volts, 50 c/s is also required.

The equipment consists of :

(1) a gauging plug, arranged to enter the work piece at each stroke of the hone, which has two or three radial nozzles fed by an air supply from

(2) a control unit which houses two pneumatic-electric relays and other control indicating equipment.

The pneumatic-electric relays are extremely sensitive and respond to signals from the gauging head to indicate on a large dial the variation of the diameter being honed, and also to operate indicator lights or remote switches. The amplification is adjustable to give full scale deflections of from 0.001 in. to 0.005 inch. These two relays are adjustable and may be set at any size within the range of the instrument.

Some of the benefits claimed for this method are :

(1) Minimum of handling and operating skill required.

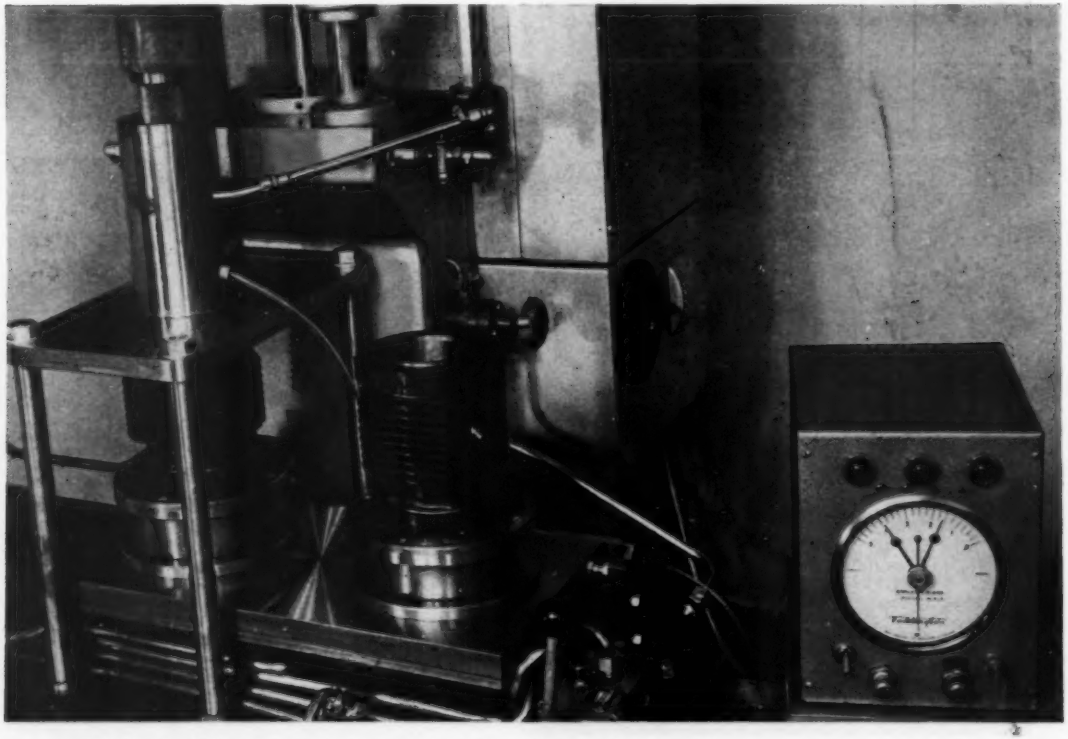


Fig 9. One of the range of automatic honing machines with air gauging by Delapena & Sons Ltd.

(2) Floor-to-floor time can be reduced by about 50%.
(3) Honing can be automatically stopped and a new cycle initiated on reaching a pre-set size.
(4) Warning lights indicate when lower limit, and required size and top limit have been reached.

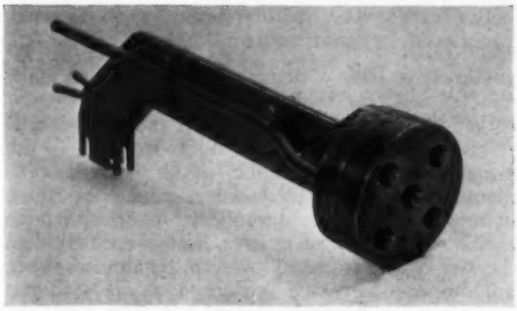


Fig 10. Delapena intensifier for progressive grinding of cylinder balls by induction heating.

Wickman Ltd.

As well as an extensive display of the machine tools for which they are already well-known, Wickman Ltd were giving a special demonstration of the new SND diamond grit recently announced by Industrial Distributors (Sales) Limited. The demonstrated equipment consisted of a grinding machine fitted with a special spindle on which two grinding wheels, one made with the old type grit and the other with SND could be fitted. As the table moved the workpiece from one wheel to the other an oscilloscope demonstrated that for equal conditions of grinding the SND wheel required appreciably less current to drive the machine.

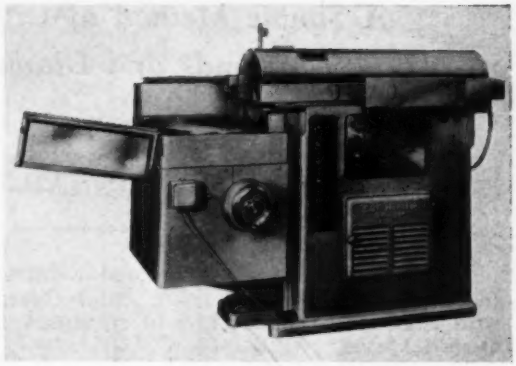


Fig 11. The Hoerster rotary table grinder marketed by Soag Machine Tool Co.

According to the Chief Inspector of Mines, Sierra Leone, more than 79,000 carats of diamonds were exported during February, 1960. The value of diamonds bought under the Alluvial Diamond Mining Scheme for that month totalled £743,000, bringing the total purchases for the first months of the current year to about £1,400,000.

Truing and Dressing

by a Special Correspondent

Some confusion appears to have arisen during the past few years over the meaning of two separate processes which can be applied to grinding wheels, and although there are certain similarities between these two actions, in essence and in purpose they differ considerably. These two processes are properly referred to as truing and dressing, and this article is intended to demonstrate what the actual differences between the two processes really are.

The basic difference is that whereas dressing is a process applied to the surface of a grinding wheel with a view to removing adhesions of metal or other material that has been removed from the workpiece and deposited on the wheel, the truing is a more drastic process designed to alter or restore the actual shape of the wheel.

Continued on p. 137

A Simple Method of Differentiating Between Natural Blue Diamonds and Diamonds Coloured Blue Artificially

by

J. F. H. Custers, H. B. Dyer and F. A. Raal*

To-day diamonds can be coloured a distinct blue artificially by appropriate bombardment with electrons or gamma-rays of an energy of about 1 MeV.

This artificial colouration, which is offered as a facility in the United Kingdom and the USA, has come to worry the ethical jeweller in that a diamond of somewhat inferior quality could be irradiated and sold by unscrupulous elements as a natural blue stone which, in comparison, is highly priced and sought after. An expert, after a lot of practice, might be able to discriminate between such diamonds, but he could not be absolutely sure just from visual inspection.

The ensuing method, which is an adaptation of one by Custers and Dyer[1] provides a simple and inexpensive way of ascertaining unambiguously whether a diamond is coloured blue naturally or artificially. The method, besides being quick, also has the advantage that a brilliant does not have to be demounted, but could be tested 'in situ' in a ring.

The basis of the method[2] is that all natural blue diamonds are semiconductors of electricity, ie, they pass an electric current, however small, on the application of a voltage across them, whereas all other diamonds to our knowledge, are insulators and do not carry an electric current.

Earphones are very sensitive to the passage of minute electric currents as witnessed by their constant use in electrical conductivity experiments. Good earphones, of which there are many miniature versions on the market, and a power supply are, therefore, virtually all that are needed for the test.

Figure 1 shows a diamond subjected to test and Figure 2 depicts the electrical circuit of the set-up.

It is found that a 30 volt hearing aid dry battery serves well as a power source, and that it is advisable to have a sharp pointed probe to make contact with the table of the brilliant. In order to get maximum response from the earphone it is best to choose one having more or less the same electrical resistance as a natural blue diamond. The electrical resistance of these diamonds vary considerably from specimen to specimen and is, of course, also dependent on the size of the stone. However, a value of about 2,000 ohms is average and an earphone with this resistance has proved most satisfactory.

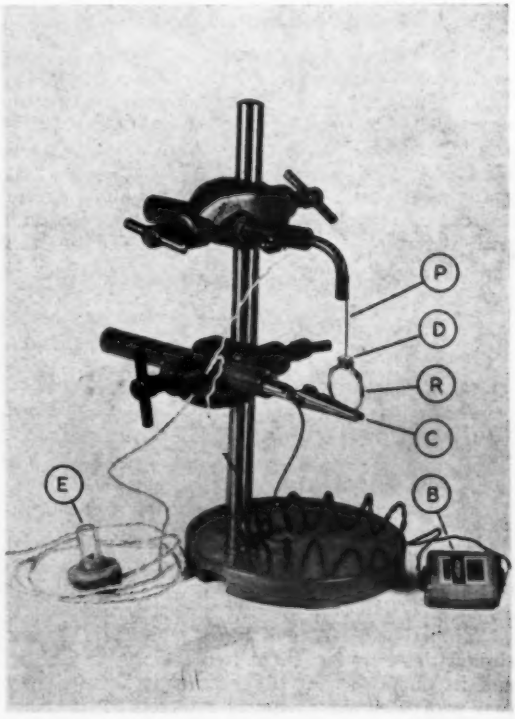


Fig 1. Layout of the equipment used for differentiating between natural blue diamonds and artificially blue diamonds.

* Diamond Research Laboratory, Johannesburg, South Africa.

The procedure of testing is as follows:

The ring R of which the brilliant has to be tested is held in position by the clip C such that the probe P just touches the surface of the diamond D. On listening with the earphone E and moving the probe P around a bit on the surface of the diamond D a scratchy noise is heard when the diamond is a natural blue one. The noise heard can be likened to that of the 'atmospherics' experienced with older radio sets. If the diamond is an artificially blue one no sound whatsoever will be detected.

Care should be taken for the probe not to come in contact with the metal of the ring as the electrical circuit would then be closed and could lead to erroneous interpretation.

Also, due to the nature of the semi-conductivity of natural blue diamonds it is essential that the probe be connected to the negative pole of the dry battery as shown in Figure 2.

A considerable number of natural blue and other diamonds have been tested in this way and, without fail, one could discriminate between them.

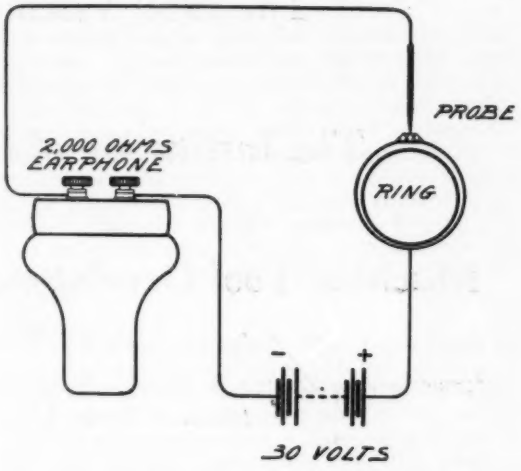
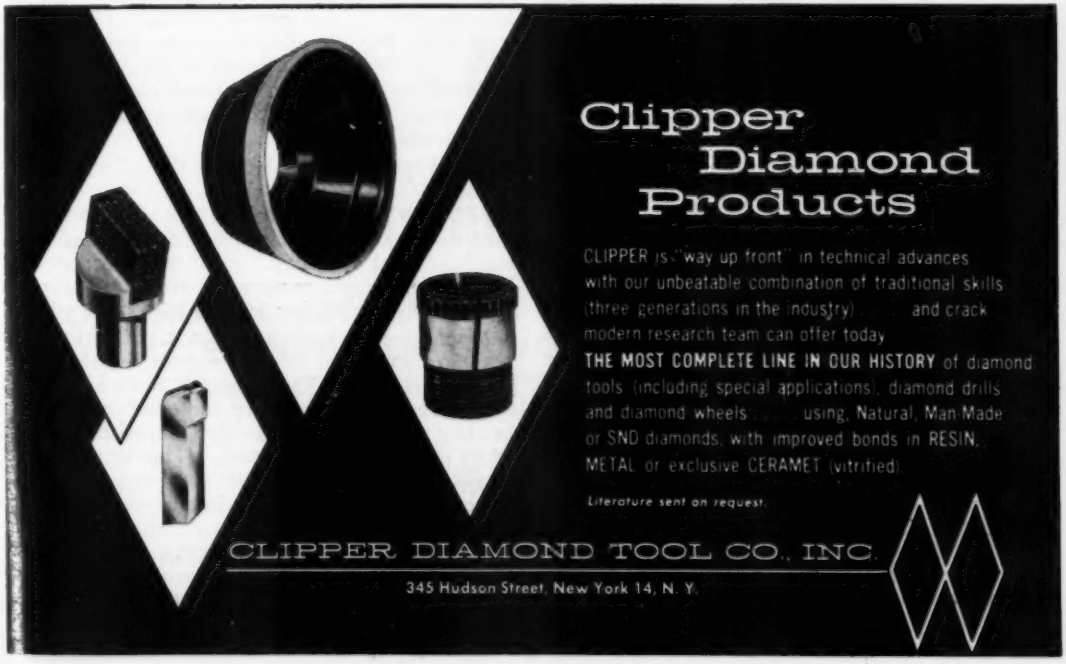


Fig 2. Schematic diagram showing the principle by which the equipment described operates. Care must be taken when testing mounted stones to avoid touching the mount with a probe or false indication may be given.

References

1) J. F. H. Custers, H. B. Dyer, *Gems & Gemology* 1954 Vol 8 (2) p 35

2) J. F. H. Custers, *Physica* 1952 Vol 18 p 489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The 1960 Viscount Nuffield Paper of The Institution of Production Engineers

Machine Tool Development and National Economy

by Sir Stanley Rawson

formerly Vice-Chairman of John Brown & Co Ltd (1953-1959) *and Director General of Machine Tools, Ministry of Supply* (1951-1953)

The paper summarized here was presented by Sir Stanley Rawson at The Royal Institution, on Monday, 27th June, 1960.

In a very large sense the paper is an enquiry into the mainspring, the "condicio sine qua non" of economic development. This development as far as instruments are concerned is the creation of little more than a century. Before going on the paper gives a definition of machine tools. "It is perhaps well to look upon any mode of, or instrument for forming constructional material as a machine tool." The history of metal rolling is then used to illustrate the variety of considerations that control the particular method or instrument adopted.

Machine tool design falls into two very broad classes, the very large and the relatively small. Big machines were needed to build the big machines of the middle nineteenth century, and their construction was greatly stimulated by the demands of naval developments and the increasing size of the steam engine. The replacement of the steam engine by the steam turbine made these huge steam engines obsolete and the machines which made them were retained only for their strategic value. Now with the greater understanding of laminated and lattice construction, it is unlikely that machines of this type will be required again.

The Paper next traces the development of the small machine. The 1914-18 War is perhaps the most decisive influence. Up to that time, the machine tool was a device which merely extended the skill of the skilled man. During the war, the machine tool became what it has since remained, an instrument of production, and every development of it has been to improve the yield and accuracy of its work. Another vital factor in this advance of the machine tool industry was the standardization of the frequency of electricity. From this point came further developments, such as the specialist maker of components, and this in turn created a demand for easy feeding, much higher speeds, easier clearing, and more power. Also there was the introduction of new cutting media. The change from high speed steel to ceramics and cemented carbides meant a revolution in machine designs and performance. The problems that this caused have so far been met with a compromise in Great Britain and the USA.

The Paper then deals with the effects of the Second World War and the Korean War, and the problems that the introduction of new cutting media — and change in general — present the machine tool industry. Also the necessity of having a strategic reserve or ability to expand production rapidly has its difficulties.

Machine tool builders are not philanthropists nor can they afford to build expensive prototypes with no future visible demand. Machine tools are instruments of industry and exist only insofar as they make practicable the manufacture of a wide range of components. The international aspect of the industry is also stressed. The machine tool industry is an instrumental industry and it is international. It embodies the brains of designers who study the most economical way in which metals, wood, and synthetics may be shaped internally and externally.

Truing and Dressing Continued from p. 133

Dressing

During the grinding process a certain amount of the removed materials from the workpiece is likely to adhere to the surface of the grinding wheel. The amount of the material so adhering would depend on a number of factors, of which the most important is the hardness of the workpiece itself (the softer the material, the more likely it is to adhere in this way). This coating of material on the surface of the wheel essentially reduces the cutting power by covering up (glazing), the edges of the abrasive grains and to restore the cutting power of the wheel, this unwanted matter must be removed. A secondary case of blunting of grinding wheels is the actual rounding of the abrasive grains themselves, which can occur in certain conditions. The resharpening of a wheel which has become blunted in this way is known as DRESSING and can be carried out in a number of ways depending on the type of wheel and the condition which it has reached. In general, however, the principle to be applied is that some form of scraping action on the surface of the wheel must be carried out and could, where possible, be done by some material which is harder than the glazing material and the bond of the wheel, but softer than the actual abrasive in the wheel. This is to ensure that the interstices between the abrasive grains are well cleaned out, but that the abrasive grains themselves remain in place. However, if the blunting is due to rounding of the grains themselves, then some action must be taken to chatter them to a controlled degree so as to present new sharp edges. This will probably have to be carried out with a material as hard as or harder than the abrasive grains. During the process of dressing it is not required that the shape or form of the wheel should in any way be altered.

Truing

The process of truing is that of producing or restoring the correct shape of the wheel and requires that the tool used is as hard as or harder than any of the component parts of the wheel. This in effect means that a diamond tool has to be used for this purpose (ignoring the question of forming by roller crushing methods—crush truing) and must be passed across the surface of the wheel along a path which is determined by the required form of the wheel. In the case of a plain, cylindrical peripheral wheel or of a straight surface cup wheel this means that the diamond is simply passed across in a straight line and can be

Continued on p. 139

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News in Brief

Parts of the Kambia and Koinadugu districts in Sierra Leone have been declared alluvial diamond mining areas, and the new order makes it legal to issue alluvial diamond prospecting rights within a mile of the Mange, Seli and Bagbe Rivers. For some time past there has been a demand to legalize the prospecting for diamonds in the Koinadugu district.

Tanganyika's diamond exports during 1959 totalled 554,670 cts worth £4,547,737 as compared to 515,762 cts worth £4,391,647 during 1958.

British Guiana's diamond production during April 1960 amounted to 74,394 stones weighing 10,416,22 metric carats. This was 22,690 stones, weighing 1,894,30 m cts, more than in March 1960.

Israel's imports of rough diamonds during the first quarter of this year valued £4,171,922.

Diamond production in South-West Africa during the first three months of 1960 amounted to 217,528 cts; sales of industrial diamonds comprised 14,815 cts worth £31,406; and 253,048 cts of gem stones worth £4,250,594 went to export.

The Sierra Leone Government Diamond Office bought diamonds worth a little over £1 million during April 1960. This brings the total of Government Diamond Office purchases during the first four months of 1960 to nearly £4 million.

During April 1960 the total quantity of diamonds deposited with the Government of Ghana amounted to 116,392 cts, as compared to 152,161 cts in April last year.

During the first quarter of 1960, Tanganyika exported 136,992 cts of diamonds worth £1,312,803, as against 52,629 cts worth £460,285 during the corresponding period in 1959. For March 1960 alone, the figure was 35,496 cts worth £316,000, as compared to 20,803 cts worth £203,479 in March 1959.

Venezuela's diamond output fell from 6,309 carats in January 1960 to 4,313 carats in February, which was even less than half the February 1959 production—10,143 carats. The main reduction was in industrials.

South-West Africa's diamond production during January 1960 amounted to 73,519 carats. Sales of industrials totalled 3,817 carats worth £7,926, while exports of gemstones comprised 108,304 carats value £1,793,048.

Diamond production in Tanganyika during the period January-February 1960 amounted to 101,496 carats worth £996,803, as compared to 31,825 carats worth £256,806 during the corresponding period the previous year. For February 1960 alone, the figures were 55,504 carats value £581,865, as against 1,802 carats value £14,898 in February 1959.

Sierra Leone's diamond exports during March 1960 valued more than £1½ million. About 78,000 carats worth £411,000 approximately (according to provisional evaluation) were exported by the Sierra Leone Selection Trust Ltd, and about 112,000 carats worth about £1,200,000 were exported under the Alluvial Diamond Mining Scheme.

Diamonds deposited with the Ghanaian Government totalled 121,760 carats during March 1960, as compared to 166,177 carats during March 1959.

Diamond production in British Guiana during the first quarter of this year amounted to 120,950 stones, weight 20,192.62 metric carats. Output during the first quarter of 1959 was 85,133 stones, weight 10,713 metric carats. The increase is reported to have been principally the result of mining activity in the upper Kurupung River, which started in November 1958 on the advice of the Geological Survey Department and is still going on. Diving equipment is being use to recover gems from the river bed.

Award to I.D.A. Manager

An interesting ceremony which took place recently in the United States was the presentation of the American Society of Tool and Manufacturing Engineers ' Outstanding Achievement Award Pin ' to Mrs. Margaret J. McGinnis, the Executive Manager of the Industrial Diamond Association of America. The award was made in recognition of the valuable work carried out by Mrs. McGinnis in the field of establishing standards for the dimensions of the shanks of diamond tools used for dressing or truing.

Mrs. McGinnis is very well known in the industrial diamond industry in the United States for the very useful work that she has done for a number of years in the organisation and administration of the Association, and we are glad to be able to record that her work has received appreciative recognition from the ASTME.

Left to right: Harry E. Conrad, Executive Secretary, ASTME, Mrs. McGinnis and George D'Angelo.

News in Brief (Continued)

Net diamond sales made through the Central Selling Organisation for South African and other producers during the period January-March 1960 valued £20,400,000, as against £22,700,000 during the first quarter of 1959 and £15,300,000 in the same period of 1958.

Private contractors are reported to be diamond drilling for the extraction of cores of rock from the interior of Kangankunde Hill, in Nyasaland's Zomba District, for mineralogical examination, and it was hoped that the programme would be completed this month. Minerals found in the region include monazite, containing cerium used for hardening steel. The drilling programme costs £5,000. The Geological Survey Department is working on a programme of trenching and collecting and examining samples.

Truing and Dressing (Concluded)

normally carried out by a very simple attachment to the table of the grinding machine. Where more complicated forms are required, a more elaborate attachment, generally of the pantograph form, where a tracing point follows a template of the correct form, but scaled-up to say ten times the size of the finished wheel is used.

In view of the similarities but important differences that exist between these two processes, it is of great importance, to avoid confusion, that the names should not be misused.

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INDUSTRIAL DIAMOND ABSTRACTS

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1960 Volume 17
JULY

DIAMOND MINING AND INDUSTRY

Demand for gem and industrial diamonds continues firm
H. F. Oppenheimer. *Financial Times* 1960 (22087) p 4 (May 18)

In his annual statement, Mr. H. F. Oppenheimer, Chairman, De Beers Consolidated Mines Ltd, reviewed the diamond market, diamond research, financial questions and general political factors. Sales through the Central Selling Organisation in 1959 reached £91,135,943, compared with the previous record of £76,772,112 in 1957. Annual consumption of gem diamonds exceeded production, but although this also applied to industrial stones, the market was powerfully influenced by the US Government's stock-piling policy, while growing competition from GEC's synthetic product must be expected in the abrasive field. Whether or not the Adamant research laboratory's synthetic grits for resinoid and metal bonded wheels will be produced in commercial quantities has not yet been decided, but research into both natural and synthetic diamond continues and the prosperity of these products depends on extending the uses of both types of diamond grit. In 1959, De Beers industrial marketing organisation introduced a new drilling material prepared especially for particular operations.

Mr. Oppenheimer also referred to the arrangements made with the Sierra Leone Government and with the Soviet authorities during 1959, both of which should add to the stability of the diamond industry.

D *F.25.361/Fh Qc.361*

Premier is one of South Africa's biggest tonnage mines
Anon. *S Afr Min & Engng J* 1960 Vol 71 Pt 1 (3505) pp 837, 839, 841 (Apr 8)

Traces the history of the Premier diamond mine and gives details of mining methods, recovery processes, diamond types, *etc.* Some four-fifths of Premier's output consists of industrial stones, about half of which are used in drilling crowns. One particular type of diamond, the Premier 'natural blue', has been found by the Diamond Research Laboratory to provide an efficient point contact transistor that is not affected by wide fluctuations in temperature. 3 illustr.

D *F Hd.361:.28*

S.A. in race to get diamond patents
Anon. *Diamond News* 1960 Vol 23 (6) pp 11, 13 (Mar)

A *F.545:.361*

Diamonds, gemstones and abrasives
Anon. *Min J, Annual Review—1960* pp 71, 73, 75

A survey of diamond mining and markets in 1959. No remarkable new deposits were found but sales through the Central Selling Organisation exceeded the 1957 record by over £14,000,000. The development of the Yakutsk and Urals diamond fields and the agreement between the Soviet authorities and the Central Selling Organisation to market surplus Russian diamonds are described. Other agreements concerning the diamond trade are covered, including the setting up of the Government Buying Office in Sierra Leone.

The impact of synthetic diamond on the market in general is discussed. Production by GEC is difficult to estimate but was probably between 2½ and 3½ million carats. De Beers successfully produced synthetic grit but no decision as to commercial production has yet been taken. Research by various firms continued and this stimulated study of natural diamond and its industrial applications : examples are the development of SND grit for resin bonded wheels and of an improved type of stone for setting in drilling crowns. The establishment of Consolidated Diamond Development Co Ltd by Englehard Industries and De Beers was symptomatic of the trend. 2 tables.

D *F.25*

Belgium exports and imports
Anon. *Gemmologist* 1960 Vol 29 (345) p 79 (Apr)

Figures for Jan, 1960, are given for rough (cuttable) diamonds and cut diamonds.

D * *F.251.3235*

Rise in Israeli diamond exports. Israels Diamantenausfuhr gestiegen
Anon. *Gold u Silber* 1960 Vol 13 (4) p 52 (Apr) (In German)

In 1959, cut diamonds exported from Israel rose to 496,757 ct worth £16.6 million Israeli, compared with 340,580 ct worth £12.1 million Israeli in 1958. The principal importer, the USA, received 40% of the Israeli exports.

K *F.251.351*

Tanganyika's trade
Anon. *Diamond News* 1960 Vol 23 (7) p 34 (Apr)

Tanganyika's diamond exports rose from £404,264 to £504,000 for the year ending Sep, 1959.

M *F.251.364*

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Tanganyika diamond exports

Anon. *Diamond News* 1960 Vol 23 (7) p 34 (Apr)

Exports for Feb 1960: 55,504 ct of total value £581,865 (209s 8d per ct). Total exports for Jan and Feb 1960: 101,496 ct of total value £996,803 (196s 5d per ct). Corresponding exports for Feb 1959: 1,802 ct of total value £14,898 (165s 4d per ct). Total exports for Jan and Feb 1959: 31,825 ct of total value £256,806 (161s 4d per ct). *M* *F.13.364*

Economic prospects in Tanganyika

Anon. *Overseas Review* [*Barclays Bank*] 1960 pp 1-2 (May)

The principal mining exports are gold and diamonds, the latter from the Williamson mine, near Shinyanga, which is jointly owned by De Beers and the Government.

D *Bfba.251.364/F.251.364*

South-West Africa [:] Minerals

Anon. *Overseas Review* [*Barclays Bank*] 1960 pp 17-18 (May)

Diamond production for Jan, 1960, totalled 83,519 ct; sales of industrial stones accounted for 3,817 ct valued at £7,926. Gem stones valued at £1,793,048 were exported. *D* *F.13.362*

Ghana [:] Minerals

Anon. *Overseas Review* [*Barclays Bank*] 1960 pp 60-62 (May)

The total quantity of diamond deposited with the Government in March, 1960, amounted to 121,760 ct; in March, 1959, the figure was 166,177 carats.

D *F.13.367*

Sierra Leone exports for January (1960)

Anon. *Diamond News* 1960 Vol 23 (7) p 34 (Apr)

The quantity and value of alluvial diamonds exported from Sierra Leone during Jan, 1960 were: Sierra Leone Selection Trust Ltd: 187,645 ct of total value £985,136 (105s 0d per ct); and the Alluvial Diamond Mining Scheme: 67,610 ct of total value £655,777 (206s 3d per ct). *M* *F.25.3672*

Alluvial diamond returns for January 1960

Anon. *Diamond News* 1960 Vol 23 (7) pp 33-34 (Apr)

Rough and uncut diamond production in January 1960 for Cape Province: 6,976.25 ct of total value £60,329 (172s 11d per ct); Private Estates: 161.00 ct of total value £1,695 (262s 3d per ct); Transvaal Province: 13,625.75 ct of total value £44,123 (64s 8d per ct). Thus, total production amounted to: 20,763.00 ct of total value £106,147 (102s 2d per ct).

M *Ebe F.13.361*

Russian diamond season

Anon. *Financial Times* 1960 (22093) p 11 (May 25)

Tass reported on May 24 the start of the working season at the Yakutia diamond mines: during the winter, sufficient quantities of hard kimberlite were broken up and the reconstruction of washing plants was completed. *D* *F Hd.33*

Geology of Mesozoic and Cenozoic sediments and the diamond potential of the southern part of the Tunguska Basin

E. I. Ravskii. *Library of Congress Mthly Index Russ Access* 1959 Vol 12 (9) p 2633 (Dec) (Original in Russian)

Book, Izd-vo Akad nauk SSSR, Moscow. 1959, 177 pp, Geologicheskii institut Trudy, No 22.

[Not in library of Industrial Diamond Information Bureau]. *D* *Eb.33*

Discoveries of diamonds on the Russian platform and prospects for the future

V. O. Ruzhitskii. *Izv Kar i Kol' fil AN SSSR* 1959 (1) pp 3-13; *Library of Congress Mthly Index Russ Access* 1959 Vol 12 (9) p 2606 (Dec) (Original in Russian)

D *Eb.33*

Incorrectly isolated type of diamond primary deposits

N. P. Mikhailov, E. D. Poliakova. *Sov geol* 1959 Vol 2 (6) pp 134-135 (June); *Library of Congress Mthly Index Russ Access* 1960 Vol 12 (12) p 3439 (Mar) (Original in Russian)

D *Ebe.33*

Diamond bearing regions of the Yakut A.S.S.R. and their industrial development

G. Granik, G. Naumov. *Plan khoz* 1959 Vol 36 (11) pp 84-88 (Nov); *Library of Congress Mthly Index Russ Access* 1960 Vol 12 (12) p 3610 (Mar) (Original in Russian)

D *Ebe.332/F.25.332*

Diamond recovery plant, State Alluvial Diggings, Alexander Bay

D. B. Smit, N. Orsmond, J. E. De Lange Strydom. *J S Afr Inst Min Metall, J'burg* 1960 Vol 60 (9) pp 453-465 (Apr)

7 illustr. *D* *Ebb F Hvm*

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF DIAMOND

An optical method of separating diamonds from opaque gravels

A. A. Linari-Linholm. *Int Min Processing Congr 1960*, preprint (VI) 38, Institution of Mining & Metallurgy, London, 11 pp; *IMM Abstr* 1960 Vol 10 (4) p 131 (Apr-May)

The diamond, particularly when of gem quality, is able to refract and transmit light, whereas its associated gangue is relatively opaque. This optical property has been made use of in the development of a separator to recover it from accompanying gangue. The separator consists essentially of an endless belt for carrying the mixture of diamonds and gravel through a light beam. By means of an electronic detector which picks up the flash of light from the diamond as it passes through the beam, the diamond is mechanically deflected from the stream of gangue material. The separator is capable of effecting complete separation of transparent and translucent diamonds from gangue; only the very dark or black diamonds are not recoverable. The inability of the machine to recover very dark diamonds, which are of industrial quality, is not a serious disadvantage, as these stones are of low value compared with the gem quality diamond. *X* *Hfb*

X-ray luminescence spectra and thermal luminescence of Siberian diamonds

E. S. Vilutis. *Izv AN SSSR Ser fiz* 1959 Vol 23 (11) pp 1379-1381 (Nov); *Library of Congress Mthly Index Russ Access* 1960 Vol 12 (12) p 3439 (Mar) (Original in Russian)

D *F.332:Ukn*

Luminescence of a large pink diamond

B. W. Anderson. *J Gemm* 1960 Vol 7 (6) pp 216-220 (Apr)

1 illustr, 5 ref. *D* *F Gbk Ukn*

New diamond available for metal bonded wheels

Metallurgical Products Dept, General Electric Co. *Carbide Engng* 1960 Vol 12 (4) p 50 (Apr)

Refers to development of synthetic diamond suitable for use in metal bonded wheels.

See also *Industr Diam Abstr* 1960 Vol 17 p A142 (June). *D* *Nvh Urc*

Dual in diamonds

Anon. *New Scientist* 1960 Vol 7 (183) p 1272 (May 19)

Refers to work at the Diamond Research Laboratory on the production of natural diamond grit especially suitable for resin bonded grinding wheels: the tiny diamonds composing the grit are sufficiently flawed to flake off in small fragments in the course of wear, rather than to tear away from the bonding agent. Solid block centre types of grit, as near flawless as possible, are being produced for metal bonded applications, and new uses are being developed.

D *Kl Nv Urb/Kl.132*

Union heads world in industrial diamond work

Anon. *S Afr Min & Engng J* 1960 Vol 71 Pt 1 (3508) pp 1031, 1033 (Apr 29)

Describes the new natural diamond grit, produced by the Diamond Research Laboratory by a process whereby the great bulk of the material prepared in 'blocky'. This, in addition to having superior holding properties in metal bonded matrices, achieves a cutting rate up to 5% faster than that obtained with any previous diamond mesh in saws and wheels. A major use of the new grit will be in the cutting of expansion joints in new concrete roads, and the shaving and smoothing of jet aircraft runways. Marble, tiles, *etc*, can also be worked more efficiently than with previous grits. The new material will be available in all sizes from Tyler Screen 20 to +325. 2 illustr.

D *Kl.131.361*

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF HARD MATERIALS

Identifying precious stones (XV). Wir bestimmen Edelsteine (XV)

Anon. *Gold u Silber* 1960 Vol 13 (4) pp 27-28 (Apr) (In German)

Colour in stones is the result of selective absorption of light. Isotropic stones absorb the light equally in all directions, but anisotropic stones absorb light according to the direction of the rays, and therefore may show more than one colour. This phenomenon, known as dichroism, is of great help in both cutting and identifying stones. 5 illustr. *K* *Bb Qv Ukb*

Identifying precious stones (XVI). Wir bestimmen Edelsteine (XVI)

Anon. *Gold u Silber* 1960 Vol 13 (5) pp 32-34 (May) (In German)

A microscope is used to examine the surface of stones in order to distinguish natural stones from synthetic. The best results are obtained with a school microscope, magnification between 20 × and 60 ×. 8 illustr.

A *Az Bb Cz Wcm/Bh Cz*

Strontium titanates examined under a microscope

H. Tillander. *J Gemm* 1960 Vol 7 (6) pp 211-215 (Apr)

Describes an examination of twelve stones using an ordinary binocular microtype instrument fitted with the American Gem Society's illuminator. Factors distinguishing strontium titanate from diamond, apart from colour, are listed. 8 illustr.

D *Bcv Cz Wcm/Bcv*F*

Patterns of surface finish

Institute of Metal Cutting, Crawcow. *New Scientist* 1960 Vol 7 (183) p 1274 (May 19)

Cheap plastic replicas for comparing the finish of machined surfaces can be made by a method developed in Poland. Intended to replace expensive metal replicas, these plastic gauges can be produced cheaply enough to offset the minor disadvantages as compared with metal replicas. *D* *Unf.193*

Creating materials harder than diamonds

S. Gushchev. *Tekh mol* 1959 Vol 27 (6) pp 7-9; *Library of Congress Mthly Index Russ Access* 1960 Vol 12 (12) p 3439 (Mar) (Original in Russian)

D *Ba Qc*

Which gems are produced synthetically? Welche Edelsteine werden synthetisch hergestellt?

Anon. *Dtsch Goldschmiede Ztg* 1960 Vol 58 (5) p 266 (May) (In German)

Reader's question.

Rubies, sapphires and spinel are the chief stones produced synthetically in Germany; synthetic emerald comes mainly from San Francisco. Synthetic rock crystal and diamond are only suitable for industrial purposes. *A* *Bbb Cr*

Action of graphite as a lubricant

W. Bollmann, J. Spreadborough (Battelle Memorial Inst). *Nature, Lond* 1960 Vol 186 (4718) pp 29-30

4 illustr, 4 ref. *D* *Sk*

Double twinning and crystal orientation

Y. N. Trehan, A. Goswami. *Proc nat Inst Aci India* 1959 Pt A Vol 25 pp 210-213; *Bibliogr sci Publ S Asia* Vol 6 (4) col 98 (Apr)

D *Ubc/Ube*

The application of optical diffraction methods to crystal-structure problems

H. Lipson. *Sci Prog* 1959 Vol 47 (188) pp 692-700 (Oct); *Instrum Abstr* 1960 Vol 15 (2) p 44 (Feb)

X-ray diffraction patterns are interpreted by comparing them with patterns produced by a mask in an optical diffractometer. *X* *Uklb*

DIAMOND, ETC, IN INSTRUMENTS

The Physical Society's Exhibition—London, 1960

T. B. Rymer. *J sci Instrum* 1960 Vol 37 (5) pp 153-156 (May)

A general survey is given of the newer developments in instruments and apparatus exhibited, together with some observations on the Exhibition.

D *W.27.321*

Preview of the Hanover Fair 1960. Vorschau auf die Messe Hannover 1960

Ernst Leitz GmbH. *Arch tech Messen* 1960 (291) pp R37-R48 (Apr) (In German)

Among the instruments shown by the firm was a surface tester giving readings according to the Forster scale. The pulsating stylus is especially noteworthy as it avoids tangential forces and the resulting profile distortions. The same firm also exhibited an interference surface tester for surfaces whose roughness cannot be measured by other methods. By this method, roughness of from 2 μ to 0.03 μ can be measured. 35 illustr. *K* *Wgh.27.322*

Piezo micro-tester

H. Hediger, Winterthur, Zurich. *EPA Digest* 1960 Vol 5 (5) pp 45-46 (May)

A simple surface finish tester is said to eliminate any ambiguity in the evaluation of irregularities. The instrument consists of a scanning head equipped with a diamond-tipped feeler pin. The relative displacement of the pin is converted by a barium-titanite torque into electrical impulses which are fed, via an amplifier, to an indicator instrument. The scale of the indicator is calibrated in micro-inches. Special heads are supplied for testing grooves, ball bearing races, tooth flanks and small bores of more than 4 mm diameter. The instrument is primarily for shop use, but is also suitable for the laborataory. 2 illustr.
D *Ndb Wgf*

Electronic Colorimeter now in its fifth year

Anon. *Guilds* 1960 Vol 15 (3) p 3 (Mar)

The electronic Colorimeter is designed to grade loose, round diamonds in the spectrum of yellow and blue, or the absence of it. This instrument is in the same class as the Diamondscope, but not as universally suitable for as many operations. Advantages are accuracy and reliability in distinguishing between the fine shades of diamond colour and quick, easy operation. 1 illustr.
D *F Ukb V Wcb*

Principles of high temperature microscopy

B. B. Brenden, H. W. Newkirk, J. L. Bates. *J Amer ceram Soc* 1960 Vol 43 (5) pp 246-251 (May)

6 illustr, 48 ref. *D* *Wjz*

Application of electron microscopy

J. Jazek. *Metal Treatm* 1960 pp 19-27 (Jan); *PERA Bull* 1960 Vol 13 (4) p 93 (Apr)
D *Vig*

Practical surface finish testing equipment for workshop use. Fuer den Werkstattgebrauch taugliches Oberflaechenrauhigkeits-Pruefgeraet

Anon. *Technica* 1960 Vol 9 (9) pp 475-477 (Apr 22) (In German)

9 illustr. *A* *Wgf.263*

HARDNESS AND WEAR TESTING

The effect of internal oxidation on some properties of copper alloy sintered compacts

R. H. Seebohm, J. W. Martin. *Metallurgia* 1960 Vol 61 (366) pp 163-166 (Apr)

Vickers diamond pyramid tests were used to determine the hardness of internally oxidized specimens, together with un-oxidized specimens for comparison. 7 illustr, 10 ref, 1 table. *D* *Bfh Cv Nd*

New static and dynamic methods of testing the physical and mechanical properties of grinding tools. Neue statische und dynamische Pruef-methoden der Physikalisch-mechanischen Eigenschaften von Schleifkoerpern

J. Peklenik. *Industr Anzeig* 1960 Vol 82 (28) pp 425-430 (Apr 5) (In German)

15 illustr, 28 ref.
K *Pe Um.21/Pe Un.21*

Study of the hardness of grinding tools. Untersuchung der Haerte von Schleifkoerpern

J. Peklenik. *Industr Anzeig* 1960 Vol 82 (28) pp 431-436 (Apr 5) (In German)

The results are given of a series of experiments in which grinding tools of varying hardness and grain size, using various kinds of bond, were tested for hardness on the basis of a newly developed method. 7 illustr, 11 ref, 6 tables. *K* *Ab Vc*

Observations on the wear process in grinding. Betrachtungen zum Verschleissvorgang beim Schleifen

K. Brueckner. *Industr Anzeig* 1960 Vol 82 (36) pp 553-558 (May 3) (In German)

The wear of a grinding wheel may be of four different types: weakening through pressure, splitting of crystal groups, partial breaking of abrasive particles, and total breaking out of abrasive particles. Wear may be measured by means of a diamond used to make a groove to a depth of 20 to 30 μ in the grinding wheel. The wear characteristics of the wheel in relation to the amount of material removed by grinding can be deduced more accurately by having both the results of the indentation method and one measurement of the radial wear. It is shown that the wear coefficient increases rapidly at the beginning of the grinding process. The curve then continues with a very slight rise. The grinding wheel wear conditions vary considerably in this region, often depending on the amount of material removed by grinding, and the conformity to normal working requirements depends on the grinding conditions. By means of a new measuring process, the grinding wheel surface can be tested and the profile shown at different stages of wear. 16 illustr, 10 ref. *A* *Ab Cw Nd/Pe Unr*

Tukon micro-hardness tester

Wilson Mechanical Instrument Div, American Chain & Cable Co; British rep: George H. Alexander Machinery Ltd, Birmingham 4. *Mach Shop Mag* 1960 Vol 21 (5) p 303 (May)

Tukon Model LL semi-automatic micro-hardness tester is said to be particularly suitable for production micro-hardness testing and can be used with a range of dead weight indentation loads from 25 to 1,000 grammes. The machine has a vertical capacity of up to 2½ in. and is equipped with a Bausch & Lomb microscope having two turret-mounted objective lenses. Removal of the indenter from the specimen is automatic; provision is made for utilizing both the Knoop and the 136° diamond pyramid indenter and it is possible to make accurate measurements of the indentation in restricted areas. A precision mechanical stage is used for supporting the specimen and positioning it accurately. 1 illustr.
D *Cvdb Nd Wghd*

New types of non-destructive electrolytic polishing methods and indentation techniques on metal surfaces. Neuartige zerstoerungsfreie elektrolytische Polierverfahren und Abdrucktechniken auf Metalloberflaechen

P. A. Jacquet. *Metalloberflaeche* 1960 Vol 14 (5) pp 132-136 (May) (In German)

1 illustr, 3 tables. (To be cont).
A *Az Bf Chmk.1456*

On the effect of ($\alpha + \beta$) phase of 2.5% Al-Mg alloy on the microhardness

T. Yoshino. *J mech Lab* 1959 Vol 13 (5) pp 35-39 (Sep) Japan); *Index aero* 1960 Vol 16 (1) p 142 (Jan)

Vickers micro-hardness test of 2.5% Al-Mg alloy has been made in the alpha phase at loads of from 1 to 10,000 g by the Kentron Micro-hardness Tester, in order to investigate the effect of the surrounding structure. *D* *Cvdb w ghd*

TRUING OF GRINDING WHEELS

From the simple universal grinding machine to the new automatic cylindrical and internal grinding machines. Von der einfachen Universal- zu neuen automatischen Rund- und Innenschleifmaschinen

L. Kellenberger & Co, St Gallen. *Technica* 1960 Vol 9 (9) pp 464-465 (Apr 22) (In German)

Kellenberger machines are described. The types 50 HRJ and 51 HRJ are cylindrical and internal grinders which can be assembled easily and quickly. They have mechanical or hydraulic control, a grinding spindle support which can be turned through 360°, and an arrangement whereby the cylindrical grinding wheel can be moved to the back of the machine to enable the internal grinding apparatus to be brought into position. Two new machines of a similar kind are 600 RJ and 1000 RJ, which are particularly suitable for the production of larger series of workpieces. New developments on these models are the hydraulic control system, the continuous grooving motion, and the rapid back and forth motion. A further interesting characteristic is the diamond grinding wheel dressing equipment for the internal grinding wheels. 9 illustr.
A *Chcl Prs/Chcn Prs*

Recent non-Russian gear grinding machines

Yu. A. Evstegneev. *Machines & Tooling* 1960 Vol 31 (1) pp 37-42 (Jan) (Original in Russian)

Among machines described are Orcutt grinders for cylindrical spur gears up to 24 in. diameter. Instead of a pantograph dressing mechanism, these machines use a direct copying device which is said to have simplified the design of the diamond dresser and ensured high quality work. Another development mentioned is the use of abrasive worm wheels. The problem of wheel dressing has been solved by the Swiss firm Reishauer by the use of diamond dressers, which make linear contact with the wheel rather than point contact. A special lapping machine, used after 8-10 dressings, keeps the diamonds sufficiently square. It is concluded that the greatest post-war developments have taken place in machines using a threaded grinding wheel which are versatile, accurate and highly productive. These machines involve the use of large diamonds and high-quality grinding wheels. Other developments are noted. 19 illustr. *D* *Add Chcl Pr:Nj Psf*

Heavy-duty dresser

Machine Products Corp, Dayton, Ohio. *Grinding & Finishing* 1960 Vol 6 (5) p 72 (May)

The new heavy-duty No 22 dresser has 2¼ in. diameter cutters and a 2 in. cutting face. It is suitable for all dressing on medium and large wheels, and particularly for wide faced wheels. It features an improved six-set bearing assembly and has an exclusive 'piston' grip handle. 1 illustr. *L* *Psf*

PRECISION MACHINING OF METALS

High precision boring by transfer machine

Cross Co, Detroit. *Mach Shop Mag* 1960 Vol 21 (5) pp 276-278 (May)

The new Transfer-matic is claimed to combine high precision finishing operations with the production economy of automation. Some bore sizes are held to tolerances of ±0.00035 in., and locations of three holes are held within ±0.001 in. each to both others. Twin milling operations establish overall part length with ±0.004 inch. Surface finish specifications are 56-110 micro-in., r.m.s., for all machining operations. Production rate is 140 parts/hr and 100% efficiency is claimed. 3 illustr. *D* *Cfdb Prs*

Micromatic ball stud milling and honing machines

Micromatic Hone Corp; British rep: A. A. Jones & Shipman Ltd, Leicester. *Mach Shop Mag* 1960 Vol 21 (5) p 301 (May)

Ball stud spherical heads can be machined by a rapid and accurate method on two special machines. The ball on the stud is machined from a forging in two operations, and it is claimed that the total error in sphericity does not exceed 0.0003 in. with a finish of from 6 to 10 micro-inches. The two operations are described. 1 illustr.
D *Az Cfj Pr/Az Chh Pr*

Drill and Microhone

Micromatic Hone Corp, Detroit 38, Mich. *Cross-Hatch* 1959 Vol 11 (4) pp 2-3 (Nov-Dec)

Describes use of Microhoning for stock removal and precision finishing at Cadillac Gage Co, where only two machining operations were found to be necessary on bores: drilling and Microhoning. 3 illustr.
D *Chhc.21*

Precision boring quills

Briney Mfg Co, Pontiac, Mich. *Carbide Engng* 1960 Vol 12 (4) p 37 (Apr)

Special precision boring quills incorporate the patented Briney Principle which allows adjusting tools as close as 0.001 in. without the loosening or tightening screws generally used in conventionally designed quills. 1 illustr. *D* *Cfd Pd Psp*

De Vlieg Microface adjustable facing head

De Vlieg Machine Co; British rep: Alfred Herbert Ltd, Coventry. *Machinery, Lond* 1960 Vol 96 (2478) p 1062 (May 11)

The Microface adjustable head, intended for plunge facing wide surfaces, is suitable for use on boring machines, turret lathes and drilling machines. The head can be supplied in sizes for facing diameters from 1½ to 8½ inches. Inter-changeable cutter blades of HSS or tungsten carbide are mounted in the head without the need for removing the latter from the machine. 1 illustr.
D *Az Chpz Psc*

Rational thread cutting

Mécanique et Plastique SA, Geneva. *EPA Digest* 1960 Vol 5 (5) pp 74-75 (May)

Both flanks are machined simultaneously by means of a cutting wheel with ground negative profile. The chips drop on either side of the cutting wheel leaving a clean cut, and as the wheel reaches the bottom of the thread, all burrs are removed from the periphery of the threads. A gauge positions the tool holder and re-grinding is done with the help of a standard gauge. As well as greater accuracy and improved finish, 40% saving in machining time is claimed. 4 illustr.
D *Ceqbd*

Machine does five jobs in one cycle

Seneca Falls Machine Co. *Tooling & Prod* 1960 Vol 26 (2) p 57 (May)

A motorized drilling head, attached to a Lo Swing automatic lathe, has enabled turning, facing and grooving of the large diameter of a direct clutch while the centre is being drilled and reamed. The special drilling/reaming attachment is used instead of a standard tailstock. Two tools on the front carriage turn separate diameters, while three tools mounted on the rear tool block perform facing and grooving operations. All tools work simultaneously. 1 illustr.

D *Ceqb Pr*

Necking cutter attachment

Maxwell Industries Inc, 493 E 5th St, Ashtabula, Ohio. *Tool Engr* 1960 Vol 44 (4) p 253 (Apr)

External machining is said to be done easily and more accurately with this necking cutter attachment mounted on a recess toolholder with adjustable stop collars that regulate the location and depth of the tool. Awkward or irregularly shaped workpieces can remain stationary while rotating the tool, or vice-versa. The attachment has a ball-bearing pilot to stop on or fit over the workpiece. It can be used for manual or mechanical feed with HSS or carbide-tipped cutters. 1 illustr.

D *Ceqb Pdb Psp/Ceqb Pdc Psp*

Boring bars

Muskegon Tool Industries Inc, Muskegon, Mich. *Tool Engr* 1960 Vol 44 (4) p 262 (Apr)

Liquid-cooled bars for adjustable boring and reaming cutters are available with straight or Morse taper shanks in a full range of sizes. Passages in the Polar Bar toolholders deliver streams of coolant directly to each of the two cutting edges, flushing away chips and preventing heat build-up. Use of the bars provides long tool life, high cutting speeds and accurate work, it is claimed.

D *Cel Pd Plk Qs/Cfd Pd Plk Qs*

Gun reamer

Star Cutter Co, 34500 Grand River Ave, Farmington, Mich. *Tool Engr* 1960 Vol 44 (4) p 276 (Apr)

Multiple flute, carbide pressure-coolant reamers produce holes to precision size and finish specifications in steel, aluminium, cast iron and bronze parts. They function in either drilled or cored holes and are adapted to precision reaming of long holes. 1 illustr.

D *Az Bf Chmz Ple*

Machining Ford Anglia front hubs with throw-away tip tools

R. E. Green. *Machinery, Lond* 1960 Vol 96 (2477) pp 988-993 (May 4)

7 illustr. *D* *Pdc*

Tool oscillation for chip breaking

Anon. *Machinery, Lond* 1960 Vol 96 (2477) pp 975, 1023 (May 4)

Summarizes investigations at Moscow Higher Technical School with lathe tools to which an oscillating motion was imparted. Provision for tool oscillation would necessarily complicate machine design and construction. It would, however, avoid the necessity for grinding chip breaker grooves or using separate chip breakers. Probably of more importance is the facility which the oscillating tool apparently affords for ensuring reliable chip breaking of various metals under different cutting conditions.

See *Machines & Tooling* 1960 Vol 30 (12) pp 11-16 ; *Industr Diam Abstr* 1960 Vol 17 p A99 (Apr).

D *Bf Ceq Pd Qn*

Ceramic versus carbide tools

Anon. *New Scientist* 1960 Vol 7 (181) p 1135 (May 5)

Recent Soviet experiments compared the performance of ceramic and sintered carbide tools in operations on hardened steels. One of the main conclusions reached is that the particular type of ceramic tested should be used only for cutting steel up to a hardness of 50 Rc, although outside Russia ceramic tools have been used for machining steels up to 63 on the Rockwell scale : while Russian ceramic tools can cut such steels, carbide tools are more economical. The experiments established that, for turning steel hardened to 45-55 Rc, ceramic tools were more effective than carbides at high cutting speeds. Carbide tools lasted longer when cutting steel with a hardness of 45 Rc at speeds below 200 ft/min, but ceramic tools were more durable at speeds above about 250 ft/minute. Carbide tool life at 328 ft/min was under ¼ min whereas ceramics cut well for 18 minutes ; however, carbide tools lasted longer when machining steel of 55 on the Rockwell scale.

D *Pdc*Pdd*

Micro-feed drive for machine tools

Odessa Special Design Bureau. *New Scientist* 1960 Vol 7 (183) p 1273 (May 19)

Tests carried out show that a micro-feed device developed in Russia successfully imparts small and accurate movements to a travelling member of a machine tool. The device makes use of the change in length of a metal rod along the axis of a magnetic field induced within it. The principles of operation are described. *D* *Pr Uqz*

Ductile chromium. Duktiles Chrom

H. L. Wain, A. R. Edwards. *Metall* 1960 Vol 14 (5) pp 387-395 (May) (In German)

Machining chromium by turning, grinding and hobbing processes is relatively easy, although thread cutting, boring and milling presents certain difficulties. 9 illustr, 108 ref. *K* *Bfxz Ceq*

Extension of the technological possibilities of large machine tools for chip producing machining of metals

A. M. Figatner. *Vestn Masstro* 1959 Vol 39 (12) pp 59-61 ; *Inhaltsverzeichnisse sowjet Fachzeits* 1960 Vol 9 (2) p 156 (Feb) (Original in Russian)

A *Bf Ceq Pr*

The horizontal drilling and milling cutter and its application. Das Waagerecht-Bohr- und Fraeswerk und seine Anwendung

H. Schallbroch. *Industr Anzeig* 1960 Vol 82 (37) p 578 (May 6) (In German)

Book, Springer Verlag, Berlin, Goettingen, Heidelberg. 1959, 212 pp, illustr, tables. Price DM 26.70.

[Not in library of Industrial Diamond Information Bureau]. *A* *Cfb Pl.52/Cff Pd.52*

Coolant apparatus for machine tools. Fluessigkeitsgetriebe bei Werkzeugmaschinen

H. Krug. *Industr Anzeig* 1960 Vol 82 (37) p 578 (May 6) (In German)

Book, Springer Verlag, Berlin, Goettingen, Heidelberg. 1959, 328 pp, illustr. Price DM 39.--

[Not in library of Industrial Diamond Information Bureau]. *A* *Pr Qs.52*

LITERATURE REQUESTS

When applying for the loan of literature abstracted in this journal, please quote the title of the article, the name of the author, and the number of the page on which it appeared.

High accuracy production boring

Armament & Control Section, General Electric Co, Johnson City, NY. *Tooling & Prod* 1960 Vol 26 (2) pp 61-62 (May)

Describes achievement of jig borer accuracy on a production basis. Hole locations on gear cluster housings and similar small parts were held to within the required tolerance of ±0.0001 in. on virtually 100% of the work. 2 illustr. *D* *Alz Cfd Pr*

Don't wait for tomorrow to fabricate titanium

B. Payne. *Tooling & Prod* 1960 Vol 26 (2) pp 63-66 (May)

A tool that retains hardness at high temperatures is needed for machining titanium. Carbide tools are recommended despite tendency to chip and spall when titanium chips weld to them. Cast alloy tools have been used successfully at slow speeds and light feeds, while HSS can also be used at high speeds, but not in circumstances where tool damage is known to be high. Although specific machining details should be obtained from the producer, all standard machining operations can be done if proper conditions are observed. It is stressed that many of the difficulties that used to be associated with titanium machining have been overcome because of improvements in titanium production and better grasp of its properties and their influence on machining. 3 illustr. *D* *Bfn Ceq*

A production man's guide to subland tools

W. Hofbauer. *Amer Mach* 1960 Vol 104 (8) pp 115-122 (Apr 18)

A subland is basically a rotating tool for cutting two or more diameters in a single pass. It may be a drill, reamer, counterbore, end mill, or a spotfacer—or it may be a combination of these on a single toolbody so that drilling can be done in one pass together with reaming, counterboring, or spotfacing. Advantages, geometry, standard and special tools, and grinding of sublands are among topics covered. 13 illustr.
D *Cfb Pd*

Machining magnesium

Anon. *Metalworking Prod* 1960 Vol 104 (18) pp 814-816 (May 4)

Magnesium alloys are the lightest constructional metals, and also the fastest machining metals : speeds can be faster, depths of cut heavier and rates of feed higher than with any other metal. Details are given for various operations. Standard tools are satisfactory. Diamond lapping to remove any roughness which might hinder the flow of chips along the tool facilitates rapid clearance of swarf from the cutting zone. 7 illustr, 5 tables. *D* *Bfk Ceq Uqfb*

Calculation of drilling time

S. K. Bhattacharyya. *Sci & Engng* 1960 Vol 13 (1-2) pp 18-27 (Jan-Feb)

8 tables. (To be cont).
D *Uqfh*

Finish turning

A. J. Pekelharing. *Microtecnic* 1960 Vol 14 (2) pp 61-69 (Apr)

Reports on different types of wear, the minimum surface roughness obtainable with new tools, a possible method of suppressing this degeneration, and a possible fine-machinability index for materials. 21 illustr, 9 ref.
D *Ceqbb Unf/Ceqbb Unr*

Copy turning lathes. [Pt III]

I. B. King. *Prod Engr* 1960 Vol 39 (5) pp 291-307 (May)

Practical examples of how these types of machines have been used to advantage are given.
28 illustr. *D* *Ceqbz Pr*

Cutting tools

H. Frommelt. *Mach Tool Blue Bk* 1960 Vol 55 (4) pp 111-113 (Apr)

Advice is given on using carbide face mill cutters. The ratio of cutter diameter to workpiece width, proper positioning of cutter in relationship to workpiece, and the method of obtaining finishes are discussed. 3 illustr.
A *Cfj Pd*

The return of the positive angle

H. Frommelt. *Carbide Engng* 1960 Vol 12 (4) pp 13-16 (Apr)

It is concluded that positive angles are not only feasible in many cases, but are desirable when using carbide tools, especially in machining tough, work-hardening materials. 7 illustr. *D* *Pdc Uqc*

Solving tough production problems with automated specials

Cross Co, Detroit, Mich. *Carbide Engng* 1960 Vol 12 (4) pp 17-19, 21 (Apr)

Describes three new automated three-way boring and facing machines for boring, facing and grooving single-speed and two-speed truck differential carriers. Most operations are high precision. 7 illustr.
D *Cfd Prs'Chp Prs*

Diamonds cut costs for fast boring cycles

Federal Mogul, Detroit. *Amer Mach* 1960 Vol 104 (8) p 107 (Apr 18)

Boring machines can finish formed bimetal bushings with either carbide or diamond tools, since these produce similar work finish and production rate. However, single-point diamond tools are preferred because their greater hardness means less tool changing : a vital consideration in this application. An example quoted is machining a rolled split bushing made with a shell of SAE 1010, a sintered-bronze liner 0.020 in. thick, and a flash coat of tin. Inside diameters are finish machined on a four-spindle boring machine to 0.986 in. ±0.0005 inch. The 1¼ in. long bushing is bored to remove about 0.0008 in. of tin-coated sintered bronze in the inside diameter. The boring diamonds rotate at 3,600 rev/min, and cut at 300 spindle ft/min, cycle time being only 10 seconds. The operation is completed without coolant. 4 illustr.
D *Agz Bfz Cfdb Nf*

Automatic control of the tool on a machine tool

A. N. Gavrilov, A. I. Fefer. *Vestn Masstro* 1959 Vol 39 (12) pp 54-56 ; *Inhaltsverzeichnisse sowiet Fachzeits* 1960 Vol 9 (2) p 155 (Feb) (Original in Russian)
A *Pd Wp:Pr*

A stop bar for multiple-spindle drills

E. D. Ward. *Mach Shop Mag* 1960 Vol 21 (5) pp 278-279 (May)

2 illustr. *D* *Pl*

Drilling high-strength materials

E. A. Brezina, R. L. Johnson, R. G. Kennedy, N. W. Marrotte (Cleveland Twist Drill Co, Cleveland, Ohio). *Tool Engr* 1960 Vol 44 (4) pp 101-104 (Apr)

Abstract of Paper 258 presented at the 28th ASTME Annual Meeting.

Tool life is critical in drilling high-strength material and can be improved remarkably by proper choice of drill design and cutting conditions. A series of extensive tests has been run to provide a general guide for drilling both extremely hard materials and thermal resistant materials. 1 illustr, 4 tables.
X *Ba Cfb.21/Baz Cfb.21*

Time savers [:] Spherical turning tool

Anon. *Mach Shop Mag* 1960 Vol 21 (5) pp 287-288 (May)

A tool for turning spheres in the centre lathe is illustrated and described. Concave and convex work can be machined. 1 illustr.

D *Ceqb Pd.21*

Automatic production on the capstan lathe

Nickols Automatics Ltd, 7 Carlisle Rd, London NW 9. *Mach Tool Mag* 1960 Vol 21 (5) pp 290-295 (May)

9 illustr. *D* *Ceqb Prs*

Milling and tooth cutting in practice. Fraesen und Verzahnen in der Praxis

E. Widmer. *Technica* 1960 Vol 9 (11) pp 641-642 (May 20) (In German)

6 illustr, 1 table. *A* *Ad Ceg/Ad Cff*

An equipment for measurement of tool cutting forces

J. Goldberg. *Electron Engng* 1959 Vol 13 (382) pp 726-732 (Dec); *Instrum Abstr* 1960 Vol 15 (2) p 73 (Feb)

The force-sensing elements are wire resistance strain gauges used in conjunction with a two-component force dynamometer. *X* *Uqg V W*

CUTTING & MACHINING OF STONE, ETC

Surface treatment of germanium for a diffused transistor

O. Mikami. *Reports of Electrical Communication Lab, Nippon Telegraph & Telephone Public Corp* 1959 Vol 7 (11) pp 414-415 (Nov)

In the fabrication of a diffused transistor, the surface of germanium to be diffused must be smooth and scratchless. Such a surface can be obtained by polishing a germanium wafer on a rayon-cloth-covered lap with diamond paste, but as this method needs care and skill an alternative has been developed. The new chemical technique consists of etching a germanium wafer in a CPD-2, a recently developed etchant. 4 illustr. *D* *Az Bfr Chm Kmg*

The preparation techniques of electron microscopy. Die Praeparationstechnik der Elektronenmikroskopie

K. Muehlethaler. *Schweiz Arch angew Wiss* 1960 Vol 26 (4) pp 157-162 (Apr) (In German)

The usual methods of preparing slides, shadowing metals, indentation and cutting technique, are described. So that the thickness of samples does not exceed 0.1 μ, it is most usual to use the method of vaporized lavers for the indentations, and special microtomes for preparing cut specimens.

A *Wcmm*

B & S slicing and dicing machine handles semi-conductor materials

Brown & Sharpe Mfg Co, Machine Tool Div, Providence 1, RI. *Amer Mach* 1960 Vol 104 (8) p 146 (Apr 18)

The 618 Micromaster uses a metal or resinoid bonded diamond wheel to produce clean, burn-free wafers of such materials as germanium, silicon and quartz crystals. 1 illustr.

D *Az Bz Cej Nv Urb*

REQUESTS FROM AMERICA

American readers who wish to order a photostat or reprint of an article abstracted in Industrial Diamond Abstracts are advised to apply directly to the appropriate journal if this is an American publication.

GEM POLISHING

Gemmological exhibition in Brussels

Anon. *Gemmologist* 1960 Vol 29 (342) pp 1-4, 16 (Jan)

A report on the gemmological exhibition at which, apart from the general display, demonstrations of gem cutting and of laboratory work were given. Among the lectures was one on irradiated gemstones. 2 illustr.

D *Bb.27.3235*

[Brilliant-cut diamond of new shape developed]

Asscher's Diamant Maatschappij NV, Amsterdam. *Gemmologist* 1960 Vol 29 (345) p 63 (Apr)

A brilliant-cut diamond of a new shape, called the trilliant, has 44 facets and a polished girdle. 1 illustr.

D *Kbb*

Do you need a second Diamondscope ?

Anon. *Guilds* 1960 Vol 15 (4) p 3 (Apr)

The new Diamondscope is basically the same as the previous model but has several improvements. For example, the cycloptic objective is par focal so that magnification can be altered without re-focusing; exceptional stability is claimed because of the turntable; while the entire instrument is of aluminium and thus is very light. 1 illustr. *D* *Wcc*

The Israeli diamond industry. Die israelische Diamantenindustrie

Anon. *Dtsch Goldschmiede Ztg* 1960 Vol 58 (5) p 271 (May) (In German)

Nearly half the medium-sized and small diamonds of the world from ¼ to 1/50 ct are cut in Israel. Trade is increasing rapidly, the USA being the most important buyer. *A* *F.25.351*

ROCK DRILLING

Use of small-calibre turbo-drills in core drilling. Emploi des turboforeuses de petit calibre dans la forage carotte

I. A. Utkin, M. I. Isaev, M. I. Agapchev, V. G. Agafonov, A. A. Galiopa. *Prospection et protection du sous-sol* 1959 (9) pp 27-30 (Sep) (In French, original in Russian)

Turbo-drilling has been shown to be more efficient than rotary drilling, because higher speeds can be maintained economically and are less apt to break down. Small calibre turbo-drills 127 mm in diameter are not, however, widely used in core drilling, as difficulties are encountered when removing the core samples. In 1958 the VITR carried out research into the problem of the application of turbo-drills. It was concluded that TSCh M-5 small calibre turbo-drills made of hard alloys can be used successfully for core drilling, as they ensure 80% recovery of the core samole up to a diameter of 70 mm, without any loss in drilling speed; hard alloy crowns working in conjunction with the TSCh M-5 at 10-12 l/sec are recommended for class VII rock. 2 illustr, 4 ref, 2 tables. *K* *Cfbd*Cfbr*

Broken Hill South Limited [:] Deflection of diamond drill holes

Anon. *'Mindrill' Bits & Pieces* 1960 Vol 13 (1) p 5 (Mar)

To check the grade of mineralization in a number of old holes, it was decided that certain holes on the 1,000 ft, 800 ft and 640 ft levels be deflected to obtain a new core through the mineralized areas. Problems met and solutions adopted are described. Mindrill Standard A size deflecting equipment was used.

D *Bc Cfb Nh.12*

Turbodrilling : what is its status today ?

W. E. Bingman. *World Oil* 1960 Vol 150 (6) pp 111-115 (May)

Extensive field testing in both the US and the USSR during 1958 and 1959 of current turbo-drilling methods and equipment, using both diamond and rock bits, led to the following conclusions : (*i*) the turbo-drill cannot yet compete economically with good rotary practices. Where effective bit weight cannot be used with rotary drilling, turbo-drilling should compete eventually ; (*ii*) rock bits have generally performed poorly on the turbo-drill. Penetration rate increases do not outweigh drastic reduction in bit footage, and cutting structure as well as bearings will require modification ; (*iii*) a few economical turbo-drill diamond bit runs have been made, but performance is too erratic to be worthwhile. Basic research is needed into effects of crown shape, diamond size, *etc* ; (*iv*) turbo-drills as well as bits need modification ; (*v*) a reliable turbo tachometer, satisfactory below 12,000 ft has been developed ; and (*vi*) basic research in bit design and modifications in the turbo-drill should be carried out before further field testing would be profitable. 1 illustr, 1 table, 2 ref.

D *Cfbd.21*

Spiral set core bits

Mindrill Ltd, Preston N 18, Victoria, Australia. '*Mindrill*' *Bits & Pieces* 1960 Vol 13 (1) p 8 (Mar)

A popular setting with small diamonds, this pattern can be made available in any diamond size. The Reverse Parallel Spiral diamond layout tends to create a re-circulating effect as the coolant passes over the cutting face during drilling. Consequently the diamonds remain cool and clean for the full life of the bit, and field tests are said to have proved that 'tracking' is eliminated in bits set in this way. 3 illustr.

D *Nhe*

Geologic evaluation of aerated water-drilled wells

P. L. Gassett. *World Oil* 1960 Vol 150 (5) pp 141-142, 147-149 (Apr)

The development of aerated water drilling is described. See also *Industr Diam Abstr* 1960 Vol 17 p A74 (Mar). 4 illustr, 2 ref. *D* *Cfb Qs Sgz*

Important stage of deep exploration

Anon. '*Mindrill*' *Bits & Pieces* 1960 Vol 13 (1) p 3 (Mar)

Refers to the use of Mindrill F 150 drilling machine See also *Industr Diam Abstr* 1960 Vol 17 p A43 (Feb).

D *Nhe.38*

Nyasaland [:] Minerals

Anon. *Overseas Review* [*Barclays Bank*] 1960 pp 31-33 (May)

A £5,000 drilling programme is being carried out at Kangankunde Hill in the Zomba district. The Dept of Geological Survey is working at trenching, collection and examination of samples, while private contractors are diamond drilling to extract cores of rock from the interior of the hill for mineralogical examination.

D *Cfb Nh.12.363*

Block caving practice at De Beers Consolidated Mines Limited

W. S. Gallacher, W. K. B. Loftus. *J S Afr Inst Min & Metall* 1960 Vol 60 (9) pp 405-429 (Apr)

Following a visit to mines in North America, it was decided to experiment with block caving at one of the De Beers mines. The system as applied to diamond mining is described. 17 illustr, 1 table.

D *Ebb Hd.3612*

From the factory [:] Diamond bits

Anon. '*Mindrill*' *Bits & Pieces* 1960 Vol 13 (1) p 6 (Mar)

Illustrations draw attention to the serious and unnecessary damage that can occur if diamond bits are used carelessly. 3 illustr.

D *Nhb.2592*

WIRE DRAWING

Importance of die measuring and inspecting instruments

Anon. *Indian Wire Industr* 1960 Vol 3 (3) pp 32-33, 40 (Mar)

5 illustr. *D* *Px Qd W/Px V W*

Copper wires

Anon. *Indian Wire Industr* 1960 Vol 3 (3) pp 34-35, 39 (Mar)

For drawing wires above 1 mm diameter tungsten carbide dies are used but for the finer sizes diamond dies are always preferred.

D *An Bfh Cn Nkb*

GRINDING AND POLISHING OF CARBIDES AND METALS

Norms for standardizing operations in grinding ; norms for cutting processes and basic time in circular external, internal, centreless, and plane grinding

Anon. *Library of Congress Mthly Index Russ Access* 1960 Vol 12 (12) p 3258 (Mar) (Original in Russian)

Book, Gos nauchno-tekhn izd vo mashinostroit litry, Moscow. 1959, 266 pp.

[Not in library of Industrial Diamond Information Bureau]. *D* *Chc.255*

Dependence of the grinding process on the physical and mechanical properties of the ground crystals

N. N. Kachalov, L. F. Grigorieva. *Dok Akad Nauk SSSR* 1959 Vol 129 p 1012 ; *Insdoc List* 1960 Vol 7 (7) col 586 (Apr) (Original in Russian)

D *Bd Chc.1456*

Classified guide

Anon. *Metalworking Prod* 1960 Vol 104 (18) pp 786-806 (May 4)

Machines exhibited at the Machine Tool Exhibition, Olympia, June 25 - July 8, 1960, are listed and classified under various headings, *eg* turning, grinding, honing and lapping, drilling and boring.

D *Pr.27.321.52*

Preview of the German Industries Fair, Hanover. Vorschau auf die Deutsche Industrie-Messe, Hannover

H. Arndt. *Metall* 1960 Vol 14 (4) pp 350-355 (Apr) (In German)

Amongst the exhibitors was Ernst Winter & Sohn, showing all types of diamond tools and equipment.

A *N.27.322*

Simple rules increase your grinding efficiency

Anon. *Mach Tool Blue Bk* 1960 (2) pp 79-80 (Feb)

A general article listing facts relating to wheel action during cutting. *E* *Pe Uqe*

Why honing, Pt II

Anon. *Grinding & Finishing* 1960 Vol 6 (3) pp 41-44 (Mar)

This part describes the types of equipment and their important points. 11 illustr.

D *Chh.21*

Why honing ? Pt III

M. M. Patterson. *Grinding & Finishing* 1960 Vol 6 (4) pp 42-45 (Apr)

This third part of the series covers tools, abrasives and coolants. 11 illustr, 1 table.

D *Chh.21*

Standard time data for grinding, Pt V

E. A. Cyrol, R. L. Borck. *Grinding & Finishing* 1960 Vol 6 (4) pp 46-52 (Apr)

Covers infeed centreless grinding and snagging. 10 illustr. *D* *Chcl.21/Cz.21*

Study of residual stresses in grinding by simulating the heat conditions

A. V. Podzei. *Machines & Tooling* 1959 Vol 30 (11) pp 39-41 (Nov) (Original in Russian)

4 illustr, 9 ref. *D* *Chc Unq*

Grinding and polishing in the precious metal industry. Schleifen und Polieren in der Edelmetall-Industrie

S. Dorner. *Galvanotechnik* 1960 Vol 51 (4) pp 190-192 (Apr 15) (In German)

2 illustr, 5 ref. *A* *Bfb Chc/Bfb Chm*

Grinding and polishing high-grade steel table cutlery. Das Schleifen und Polieren von Edelstahl-Essbestecken

I. Weber. *Galvanotechnik* 1960 Vol 51 (4) pp 196-197 (Apr 15) (In German)

5 illustr. *A* *Az Bfd Chc/Az Bfd Chm*

The Gebrueder Sulzer AG workshop for the production of heavy parts at Winterthur. Die Grossbearbeitungshalle der Gebrueder Sulzer AG in Winterthur

H. Wirth. *Technica* 1960 Vol 9 (8) pp 377-379 (Apr 8) (In German)

Since large chip producing machines are used in this workshop, perfect sharpening of the expensive sintered carbide and HSS tools is very important. The article describes briefly the methods used. 11 illustr.

K *Al Chc*

Grinding machine coolant clarifiers

F. A. Maiorova, A. I. Rivkin, Ya. I. Tokarev. *Machines & Tooling* 1959 Vol 30 (11) pp 13-16 (Nov) (Original in Russian)

An article on recent research in both Russian and non-Russian industry. 10 illustr.

E *Sjg.131*

Large metal removal rates by honing

A. P. Babichev. *Machines & Tooling* 1959 Vol 30 (11) pp 34-36 (Nov) (Original in Russian)

Describes work carried out on a Model 384 vertical honing machine using a standard design honing head. The conclusions, drawn from data obtained from machining various materials, are listed in some detail. 3 illustr. *E* *Chh.21*

Try feeding the coolant through the grinding wheel itself . . . this is what the Russians have to say about the idea

J. A. Waller, B. P. Martinov, A. I. Rivkin. *Canad Mach* 1960 Vol 71 (4) pp 190, 192 (Apr)

See also *Industr Diam Abstr* 1960 Vol 17 p A76 (Mar).

2 illustr. *D* *Chc Pe Qs Sjg*

The machine tool industry in the Polish Peoples Republic

E. E. Micyurevich. *Machines & Tooling* 1959 Vol 30 (11) pp 5-8 (Nov) (Original in Russian)

The Polish machine tool industry manufactures cylindrical, centreless, internal and horizontal grinding machines, instrument grinding machines and tool grinders, also specialized grinding machines, including roll grinding machines. New designs of standardized cylindrical grinding machines are outstanding in this group. 6 illustr. *D* *Pr.25.329*

Present state of development and future trends of machine tool control and supervision. Stand und Entwicklungstendenzen der Werkzeugmaschinen-Steuerung und -Ueberwachung

H. Opitz, H. Uhrmeister. *Werkstattstechnik* 1960 Vol 50 (3) pp 117-121 (Mar) (In German)

10 illustr. *A* *Pr Wp*

Grinding with synthetic diamonds. Schleifen mit synthetischem Diamant

Anon. *Metalloberflaeche* 1960 Vol 14 (4) pp 124-125 (Apr) (In German)

Synthetic diamonds are said to have certain advantages over natural diamonds for some grinding purposes. The new Winter K-plus diamond wheels are impregnated either with synthetic diamonds or a mixture of synthetic and natural. They are delivered in all shapes and sizes and extreme efficiency is claimed. The grinding of samples for microscopic grain examination with diamond wheels is also described. See also *Industr Diam Abstr* 1960 Vol 17 p A48 (Feb).

1 illustr. *K* *Bfa Chc Nv/Nv•Nvh*

Depth of penetration of deformation in metallographic samples. Untersuchungen ueber die Eindringriefe der Verformung bei der Herstellung metallographischer Schliffe

F. Lihl, H. Maver. *Z Metallk* 1960 Vol 51 (3) pp 186-190 (Mar) (In German)

Describes experiments made to determine quantitatively the deformation resulting from preparing metallographic samples. It was found that wet ground samples have a deeper deformation than dry ground samples. Samples polished with aluminium oxide retain a considerably deformed surface, even after etching, while electrolytic polishing removes the deformed layer completely. 5 illustr, 1 table.

K *Bfa Chc Unk*

Production of helical-keyed shafts and gears for a torque-sensitive drive

S. Herman. *Machinery, Lond* 1960 Vol 96 (2478) pp 1068-1070 (May 11)

Finish grinding and honing are covered. 4 illustr.

D *Agz Chct/Agz Chh*

Crankshaft lapping now reduced to 3 simple steps

F. K. Jones. *Grits & Grinds* 1959 Vol 50 (10) pp 7-9 (Oct)

Describes the No 31 Crank-O-Lap crankshaft lapping machine.

See *Industr Diam Abstr* 1960 Vol 17 p A47 (Feb).

3 illustr. *D* *Agn Chd Pr*

'Mount Up'

C. Soderlund. *Grits & Grinds* 1959 Vol 50 (10) pp 3-6 (Oct)

By following this instruction stencilled on Norton wheels, a wheel with a built-in balance will also be in good balance on its own wheel sleeve. 3 illustr.

X *Pe.139*

Precision grinding research

H. Grisbrook. *Prod Engr* 1960 Vol 39 (5) pp 251-269 (May)

According to evidence cited here, it seems possible that there are two different mechanisms of metal removal in grinding, and that at some stage the process changes from one predominantly of cutting as comparable with the milling operation, to one of rubbing. Such a suggestion does not depend on the theory of critical chip thickness where theoretical shear strength of the work material is involved. Experiments were carried out which confirmed this hypothesis. The machine used for investigations was a Churchill N.B. Model surface grinder of standard design. Diamond truing of the wheel is described. 18 illustr, 23 ref, 6 tables. (To be concl).

D *Ab Cg Nj/Chcw Pr.131*

Possibilities for replacement of structural parts on machine tools in accordance with VDI 3270 — 3275. Einsatzmoeglichkeiten der Baueinheiten fuer Werkzeugmaschinen nach VDI 3270 bis 3275

J. Wollenhaupt. *Werkstattstechnik* 1960 Vol 50 (3) pp 149-153 (Mar) (In German)

13 illustr, 6 ref. *A* *Pr Qb*

The Fourth Production Exhibition

Haesler Sales, 4 Grange St, St Albans, Herts. *Machinery, Lond* 1960 Vol 96 (2478) pp 1073-1077 (May 11)

The Safag No 127 hydraulic grinding and lapping machine for tungsten carbide cutting tools is among exhibits described. A maximum of four diamond-impregnated wheels may be mounted on the spindle; two of these, 8 in. diameter, are for grinding and lapping front and side clearance faces, while a 4 to 5 in. diameter wheel can be provided for grinding chip-breaker grooves. A cup-shaped wheel, 4 to 6 in. diameter, can be used with a swivel-type attachment for grinding nose radii. 7 illustr.

D *Al Chc Nv Prx/Al Chd Nv Prx*

Belts grind turbine buckets and blades

L. F. Brynes. *Metalworking Prod* 1960 Vol 104 (20) pp 894-895 (May 18)

Finding that conventional wheel grinding of the inside and outside diameters of assembled gas-turbine stators was no longer adequate, GEC have turned to belt grinding and have developed a new kind of abrasive belt grinder for the purpose. It has been found that it is not only faster than conventional wheel grinding, but also cheaper. 2 illustr. *D* *Aq Chc Pee*

Samand grinding and lapping machines for tungsten carbide tools

Samand Engineering Ltd, Water Lane, Halifax. *Machinery, Lond* 1960 Vol 96 (2470) pp 610-611 (Mar 16)

Type RG of the range uses 14 in. diameter silicon carbide grinding wheels, mounted on both ends of the spindle for grinding and lapping tungsten carbide tools. A special feature is that the wheel guards have swivel front and side pieces which can be swung clear to expose part of the face and periphery of each wheel. 2 illustr.

D *Al Bkc Chc Pr/Al Bkc Chd Pr*

Electric jig grinder

Precise Products Corp. *Tooling & Prod* 1960 Vol 26 (1) p 72 (Apr)

A compact high torque electric unit will convert a vertical milling machine into a precision electric jig grinder, which is suitable for grinding or micro-milling holes to tolerances of 0.001 in. and closer.

D *Alz Chc Pr*

Automatic tap grinder push-button controlled

Newall-Keighley. *Canad Mach* 1960 Vol 71 (2) p 119 (Feb)

Model ANL thread grinder is designed for the high speed quantity production of small taps up to $\frac{1}{4}$ in. and other threaded components of similar size. The machine is totally enclosed, fully automatic in operation and, after initial setting up, is controlled by a single push button. Re-forming of the grinding wheel is done automatically by pre-setting a control. 1 illustr.

D *Chc Prs Wp*

Infeed grinding attachment

Lordstown Tool & Die Co Inc, Warren, Ohio. *Tooling & Prod* 1960 Vol 25 (12) p 118 (Mar)

Precision grinding and duplicate sizing with wide variable feed rate of 12 to 40 pieces/min, depending upon tolerance and finish desired, are possible with the new automatic Lo-Die centreless grinder infeed attachment. It features a controlled grinding and dwell cycle that removes stock and ensures a constant finish. 1 illustr. *D* *Chcc Prs*

Precision grinding the joint faces of die sets and press tools

Lumsden Machine Co Ltd, Gateshead. *Mach Tool Rev* 1960 Vol 48 (283) pp 18-21 (Jan-Feb); *Machinery, Lond* 1960 Vol 96 (2474) p 840 (Apr 13)

This plano-type machine, the Lumsden No 230-X, not only meets the requirements of the toolroom and maintenance shops where the grinding and modifications of die-sets and tools are done, but also enables a wide range of relatively large and complex surfaces to be precision ground. A high order of accuracy in surface finish, size and parallelism is said to be obtained. 7 illustr.

D *Al Chc Pr/Ax Chc Pr*

Machine grinds carbide-tipped circular saws automatically

W. von Arnauld Co, 95 Grove St, Oakland, NJ. *Amer Mach* 1960 Vol 104 (8) p 150 (Apr 18)

Vollmer ASHK-1000 saw blade grinder, made in Germany, grinds carbide-tipped circular saws automatically. The electro-hydraulic machine is available in Model A for re-sharpening saws or Model B for manufacturing saws. 1 illustr.

D *Alz Bk Chc Prs*

Small wheel pneumatic grinders have speeds to 25,000 rpm

Thomas C. Wilson Inc, 21-31 44th Ave, Long Island City 1, NY. *Amer Mach* 1960 Vol 104 (8) p 166 (Apr 18)

Series 921 offers a choice of ten operating speeds, 16,000 to 25,000 rev/min, for driving small grinding wheels, rotary files, carbide burrs, and sanding and cutting disks. They are available in spindle and collet chuck models with lever, push-button, or ring-throttle control. Spindle and collet adapters permit the grinders to take a wide choice of grinding wheels and mounted accessories. 1 illustr. *D* *Chc Prz*

Rotary grinder guide

A & S Production Tools Inc, 17 Hermon St, Worcester 8, Mass. *Tool Engr* 1960 Vol 44 (4) p 257 (Apr)

Chamfering, deburring and other machine operations can be done accurately and quickly with a device equipped with adjustable guides to allow pre-set depth of cut on both straight and curved edges in either air or electric rotary portable grinding operations. It can be equipped with a variation of guide design and cutters appropriate to the application. 1 illustr.

X *Chcf Pr*

Rectangular-shape disc permits full-view grinding operation

Behr-Manning Co, Troy, NY. *Amer Mach* 1960 Vol 104 (8) p 149 (Apr 18); *Grinding & Finishing* 1960 Vol 6 (4) pp 54-55 (Apr)

Vizi-Disc is a special fibre-backed abrasive disk with two parallel straight sides with a radius at each end. As it rotates, a full inch at its outer edge becomes transparent. Resulting advantages claimed are faster grinding through elimination of frequent inspection; reduced dwell time because grinding can be confined within the exact area needed; and complete accuracy in contour work and blending of welds. Since actual grinding is intermittent, metal remains so cool that heat distortion is said to be impossible. Disks in 7 and 9 in. sizes are surfaced with Metalite, an aluminium oxide abrasive, in standard range of grit sizes. 1 illustr.

See *Industr Diam Abstr* 1960 Vol 17 p A152 (June).

D *Chc Pez Rj:Pr*

Barrel finishing machine

Chicago Wheel & Mfg Co, 1101 W Monroe St, Chicago 7, Ill. *Tool Engr* 1960 Vol 44 (4) p 269 (Apr)

A portable tumbling machine uses all conventional tumbling media or compounds for deburring, radiusing and finishing of small parts. The machine is loaded, actuated and unloaded by the operator. 1 illustr.

D *Az Chmz Pr*

Lapping tool

MKM Machine Co, 325 Main St, Little Ferry, NJ. *Tool Engr* 1960 Vol 44 (4) p 276 (Apr)

A clusterlap unit laps reamers without removing them from the machine set-up. One lap provides sixteen adjustable sizes, while six provide a range of from 1/32 to 1 inch. The unit can also be used to lap standard drills to off sizes and for final sizing and finishing of plug gauges. 1 illustr. *D* *Ald Chd Pr*

Gear honing machine

National Broach & Machine Co, 5600 St Jean, Detroit 13, Mich. *Tool Engr* 1960 Vol 44 (4) p 232 (Apr)

Model GHD provides four separate honing methods and can handle gears up to 12 in. pitch diameter, or, with automatic loaders, gears up to 4 in. pitch diameter. The machine has a 5 in. stroke and uses a 10 in. diameter honing tool. Manual, semi-automatic and fully automatic loaders are optional. 1 illustr.

D *Ad Chh Prsb*

Universal tool grinder with automatic grinding feed and pre-selection. Universal-Werkzeugschleifmaschine mit automatischer Schleifzustellung und Vorwaehlbarkeit

Anon. *Industr Anzeig* 1960 Vol 82 (28) pp 437-438 (Apr 5) (In German)

New machines permit the grinding of a wide range of tools and at the same time fulfill the demands for greater automation. The machines are made in two versions for use with grinding wheels of 300 or 250 mm diameter and for workpieces with a maximum diameter of either 400 or 300 millimetres. 1 illustr.

K *Al Chc Pr*

Jig grinder

Vulcan Tool Co, Dayton. *Mach Tool Blue Bk* 1960 Vol 55 (4) p 244 (Apr)

The Vulcanaire is an air driven, high speed, precision grinding instrument equipped with special adapters to fit the spindle of machine tools such as jig borers. Hardened holes of 1/16 in. to 1¼ in. diameter can then be finish ground to tenths. The tool is 7¼ in. long. 1 illustr. *A* *Alz Chc Pr*

Surface grinders

Hermes Machine Tool Co Inc, 48-15 Northern Blvd, Long Island City 1, NY. *Tool Engr* 1960 Vol 44 (4) p 250 (Apr)

Intricate profiles may be plunge ground on Blohm surface grinders, which can be equipped with wheel crushing and profiling attachments. Other attachments include a longitudinal duplicator for thread rolling die jaws and units for crush forming, heavy-duty wet grinding and wheel forming. 1 illustr.

D *Chcm Pr*

Grinding fixture

Vee Bee Manufacturing Co, Muskegon Heights, Mich. *Mach Tool Blue Bk* 1960 Vol 55 (4) p 250 (Apr)

The V-B universal grinding fixture has a variety of tool grinding applications, and is equipped with three plane angular movement, automatic index and simplified brake. 1 illustr.

A *Chc Psc*

Surface grinder

Moore Special Tool Co, Bridgeport, Conn. *Tool Engr* 1960 Vol 44 (4) p 240 (Apr)

Maximum table traverse speed of Type S-3 surface grinder is 125 ft/min, reducing grinding time as much as 50% over that of similarly sized machines and reducing burn, checking and cracking, it is claimed. The machine can be set up for wet grinding. Optional equipment included dust collection unit, wheel guard truing and automatic downfeed. 1 illustr.

D *Chcm Pr*

Precision jig grinder

Moore Special Tool Co. *Tooling & Prod* 1960 Vol 26 (1) p 82 (Apr)

Model 3 jig grinder features finer tolerances, greater range and larger table. It grinds straight or tapered holes, and regular or irregular contours to size and location after hardening. 1 illustr.

D *Alz Chc Pr*

Scope of honing machines widens

Nagel GmbH, Germany; British rep: Wickman Ltd, Coventry. *Metalworking Prod* 1960 Vol 104 (20) pp 896-898 (May 18)

Photographs show recent developments incorporated in a variety of automatic honing machines. 8 illustr.

D *Chh Pr*

Practical ideas [:] Taper pin grinding fixture

C. S. Frank. *Metalworking Prod* 1960 Vol 104 (20) p 915 (May 18)

2 illustr. *D* *Agq Chc Psc*

Turret lathe grinds contours

Bullard Co. *Tool Engr* 1960 Vol 44 (5) p 101 (May)

Designed primarily for grinding contours, this tracer controlled machine can also perform internal and external machining operations utilizing many standard components normally used in vertical turret lathes and boring mills. An unusual feature is the use of a side head instead of a ram-type head. All grinder head movements are controlled by two followers which ride the edge of the template: one follower controls horizontal and vertical feed and the other the swivelling mechanism. This type of control means that the plane of the grinding wheel, at the point of contact, is always perpendicular to the plane of contour tangency. The result is said to be longer wheel life and smoother surface finish than is possible with point contact grinding. Conversion to machining operations is done by replacing the grinding unit with a cutting tool. 2 illustr. *D* *Ceqb Pr:Chc Psc*

Beacon surface grinder

Beacon Machine Tools Ltd, Hurst Lane, Tipton, Staffs. *Mach Shop Mag* 1960 Vol 21 (5) p 309 (May)

The new type V4 surface grinder has a 7 in. diameter, ½ in. width grinding wheel, table traverse movements of 16 in. and 7 in., while table working surface measures 15 × 5 inches. 1 illustr. *D* *Chcm Pr*

Morrisflex Grasso diegrinder

British Rep : B. O. Morris Ltd, Morrisflex Works, Briton Rd, Coventry. *Mach Shop Mag* 1960 Vol 21 (5) pp 309-310 (May)

The Grasso type 511 air-operated die grinder is suitable for driving tungsten carbide rotary cutters and mounted points. The tool weighs about 2 lb and uses 12 cu. ft air/min ; it consists of a vane type motor connected to a grinding spindle and giving a running speed of 22,000 rev/minute. 1 illustr.
D *Ax Chc Pr*

Grinding threads in rough parts

R. L. McKee. *Grinding & Finishing* 1960 Vol 6 (4) p 23 (Apr)

After the ends of 1020 steel pins had been turned and centred in the conventional manner, special threads were ground on a heavy duty Ex-Cell-O thread grinder, using 18 in. resin bonded 80-grit aluminium oxide thread grinding wheels. While direct comparisons with single point threading were not possible, since this was not a repetitive, long-run production job, the results were found to be superior from the standpoint of economy as well as of quality. 1 illustr.
D *Agq Bfd Chcp Nv Urb*

Lapping equipment

Crane Packing Co, Morton Grove, Ill. *Grinding & Finishing* 1960 Vol 6 (4) p 61 (Apr)

A new control for automatically checking and maintaining lap plate flatness, an electro-mechanical device, is featured for the first time on a recent Model 24 Lapmaster lapping machine. The control is said to ensure automatic quality control with very close tolerances and to enable Model 24 to lap varied materials on a production basis within tolerances of one light band and micro-inch finishes of 2 to 3 r.m.s. with uniformity. 1 illustr.
D *Chd Pr Wp*

Hydraulic surface grinder

Micromatic Hone Corp, Detroit. *Mach Tool Blue Bk* 1960 Vol 55 (4) pp 246, 248 (Apr)

Shown at the ASTME exhibition in Detroit, Model 540, with 6 in. by 18 in. capacity has simple controls, table transverse rates variable from 5 ft to 40 ft/min, and cross-feed automatically variable from 0.01 to 0.07 in./stroke. The micrometer adjustment for cross feed is in 0.0001 in. divisions. The wheelhead slide is operated on ball bearing rollers running on precision ground bars. 1 illustr. *A* *Chc Prx*

MACHINING DEVELOPMENTS

Spark erosion for industry

E. W. Cooper. *Metal Treatm* 1960 Vol 27 (176) pp 197-207 (May)

Outlines the economic possibilities of spark erosion in its applications to the manufacture of small and medium-sized components such as are used in the motor car industry. 10 illustr.
D *Ceqm.25*

Present state of electric spark machining of metals ; a survey

E. M. Levinson. *Library of Congress Mthly Index Russ Access* 1960 Vol 12 (12) p 3257 (Mar) (Original in Russian)

Book, Leningr dom nauchno tekhn propagandy, Leningrad. 1958, 105 pp.
[Not in library of Industrial Diamond Information Bureau]. *D* *Az Ceq Pdcbz*

Swiss machine tool developments at Basle

Anon. *Metalworking Prod* 1960 Vol 104 (18) pp 825, 827, 829, 831 (May 4)

Two firms collaborated to produce the SIP-AGIE co-ordinate erosion machine, which is basically the MP-IH optical jig borer, built by Société Genevoise de Physique, fitted with an electro-erosion head and generator, made by AG fuer Industrielle Elektronik. The use of spark discharge as the cutting medium is aimed at eliminating a source of error in jig borer and grinding machines, *ie* deflection of the spindle due to side thrust of the cutting tool or grinding wheel. Among other machines described is a Studer PSM150 fully automatic profile grinder. It is equipped with an electronic tracer control, thus freeing the operator and giving constant feed along the whole profile of the template ; in this way, wheel wear is said to be reduced and work accuracy improved. 9 illustr.
D *Chc Pr.27.323*

Hydrospark forming . . . evolution of the process

H. J. Wagner, J. G. Dunleavy. *Tool Engr* 1960 Vol 44 (3) pp 83-86 (Mar)

Discusses the differences between electro-hydraulic methods of working metals and electro-spark machining. 5 illustr, 19 ref.
E *Bf Ceqhz*Bf Ceqm*

US research in ultra-high-speed machining [Pt 1]

Lockhead Aircraft Corp. *Metalworking Prod* 1960 Vol 104 (20) pp 889-893 (May 18)

Investigations into the feasibility of machining aircraft and missile materials at ultra-high speeds have recently been carried out in the USA. Tests were made using high explosive as the power source at cutting speeds up to 360,000 surface ft/min in some cases, although the majority were between 15,000 and 250,000 surface ft/minute. Tests covered titanium, aluminium, stainless steel and alloy steels. From most points of view the best tool life was found at speeds around 120,000 surface ft/minute. 9 illustr.
D *Bf Ceqr.131.342*

Plasma flame speeds metalworking

J. A. Browning. *Tool Engr* 1960 Vol 44 (4) pp 105-108 (Apr)

Most plasma equipment is being used for experimental and development purposes ; many additional applications are expected to arise out of these, including lathe cutting and drilling of hard-to-machine materials. The transferred-arc would probably be used. 4 illustr. *D* *Bf Ceqm Ptz*

Electro-machining comes of age

E. J. Clement. *Mill & Factory* 1960 pp 91-94 (Jan) ; *PERA Bull* 1960 Vol 13 (4) p 95 (Apr)
D *Ceqm*

The full use of electric discharges for machining metals. Auznutzung elektrischer Entladungen zur Metallbearbeitung

G. Stute. *Z Ver dtsch Ing* 1960 Vol 102 (10) p 399 (Apr 1) (In German)
A *Bf Ceqm*

Electrolytes for polishing alpha-iron, tin bronze and beryllium bronze. Elektrolyte zum Polieren von Alpha-Eisen, Zinnbronze und Berylliumbronze

G. Bassi. *Z Metallk* 1960 Vol 51 (4) pp 219-220 (Apr) (In German)

Two electrolytes free of perchloric acid are given for electro-polishing of α-iron and of tin and beryllium bronzes. The time of polishing depends on whether the specimen has been pre-polished with diamond. Pictures show the applicability of these electrolytes. 4 illustr.

A *Bfxh Chm Kmg/Bfxh Chmk*

Production and tensile testing of strain-free metal specimens

G. Greetham, A. J. Martin. *J sci Instrum* 1960 Vol 37 (5) pp 160-162 (May)

The shaping of metal specimens is usually done mechanically: this work-hardens the specimen surface and makes annealing necessary before mechanical testing. When mechanical working or annealing are undesirable before mechanical testing, *eg* in single crystal work, an electrolytic method which produces shaped strain-free specimens can be used. The method and a Polanyi tensile machine are described. 4 illustr.

D *Bfa Ceq Unq*

Non-destructive technique for observations, especially metallographic, of metal surfaces

P. A. Jacquet. *ONERA Note tech* 1959 (54) 48 pp; *Index aero* 1960 Vol 16 (1) p 61 (Jan); *Metalworking Prod* 1960 Vol 96 (18) pp 363-364 (Apr 29)

The method of localized electrolytic polishing using an electrode covered with an absorbent corrosion-resistant material, *eg* fibre-glass or foamed plastic, is described. The equipment is designed for testing materials *in situ*, when samples cannot be prepared conveniently for conventional metallographic examination. After the electrolytic etch of the chosen area, a replica is obtained by applying a peelable plastic material, initially in liquid form. Detailed description is given of the technique and electrolytes used.

D *Bfa Chmk*

DoAll band machines use quenched electric arc for high-speed cutting of honeycomb

DoAll Co, Des Plaines, Ill. *Amer Mach* 1960 Vol 104 (8) p 146 (Apr 18)

A line of three electro band machines, using an electrical machining process known as quenched arc cutting, is designed to cut honeycomb of aluminium, stainless steel or titanium and other fragile cellular structures made of foil or thin-wall tubing. Work at ground potential is fed into the rapidly moving saw band carrying a low-voltage high amperage current that arcs between the leading edge of the band and the workpiece. A flood of coolant limits or quenches the arc. 1 illustr.

D *Az Bf Ceqm Qs Sj*

Elox spark machining equipment

Elox Corp, Troy, Mich. *Machinery, Lond* 1960 Vol 96 (2477) pp 985-987 (May 4) British Rep: Marbaix Industries Ltd, Valiant Hse, Vicarage Crescent, London SW 11

Type M-500 spark erosion machine is fitted with a motor-driven, disk-type electrode unit, and a servo-motor drive for the table traverse screw, which have been introduced by Elox Corporation. With the aid of these attachments, spark machining of dies and the end face of punches for press tools, *etc*, can be done by a method analogous to surface grinding. Types HRP-100 spark erosion machine and M-650-H equipment are also described. 4 illustr.

D *Ceqm Ptc*

Ultrasonic machining accelerated by simultaneous anodic etching

A. I. Markof, B. N. Lyamin. *Aviatsionnaya prom-st'* 1958 (2) p 41; *LLU Transl Bull* 1960 Vol 2 (5) p 424 (May) (Original in Russian)

D *Ceqr*

PRODUCTION, GRADING & RECOVERY OF ABRASIVE PARTICLES

Particle size analysis for the chemical engineer

L. Cohen. *Chem & Process Engng* 1959 Vol 40 (11) pp 383-386 (Nov); *Instrum Abstr* 1960 Vol 15 (2) p 72 (Feb)

Instruments for particle size analysis available in Great Britain are reviewed. *X* *Vgf*

Using diamond dust suspension in studying nuclear splitting on carbon

A. P. Zhdanov, P. I. Fedotov. *Pribory i Tekhnika Eksperimenta* (Akad nauk SSSR) 1959 (3) p 133 (May-June); *Library of Congress Mthly Index Russ Access* 1959 Vol 12 (9) p 2408 (Dec) (Original in Russian)

D *Km Vwgb.21*

The combustion temperature of diamond powder. Die Verbrennungstemperatur von Diamantpulver

E. Jakob. *Zeits Dtsch Ges Edelsteinkde* 1959 Vol 29 pp 16-18 (Autumn); abstr *J Gemm* 1960 Vol 7 (6) p 230 (Apr) (Original in German, abstr in English)

D *Km Vb*

A study of the efficiency of dense media separators used in diamond dressing

A. C. Nesbitt, R. G. Weavind. *Int Mineral Processing Congress 1960* preprint (V)26, Institution of Mining and Metallurgy, London, 10 pp; *IMM Abstr* 1960 Vol 10 (4) p 137 (Apr-May)

Gravity concentration is shown to play a major role in diamond dressing. The efficiency of the dense media separators was determined by means of the Tromp curve and its 'probable error'. The efficiency of the HMS process was found to be closely related to media viscosity, and a study was made of the factors that affect viscosity and of the means to reduce it.

X *Hfz*

TOOL PRODUCTION

Buyers eye disposable tools at Detroit show

Anon. *Purchasing Week* 1960 Vol 3 (18) pp 1, 26 (May 2)

At the ASTME Show, 1960, in Detroit, there was evidence that the use of disposable inserts is increasing more rapidly. The latest inserts are being made with as many as 20 cutting edges. The insert is simply rotated as soon as one edge becomes dull. It is claimed that there is more life in the mechanically held carbide tip than in the brazed tip construction tool; the need for skilled labour to re-grind tools is avoided and the manufacturer obtains uniform cutting edges. *K* *Rdcb.27.342*

Avoid tool troubles . . . by proper selection and treatment of tool steels

A. F. Torok. *Tooling & Prod* 1960 Vol 26 (2) pp 54-57 (May)

2 illustr, 1 table. *D* *Pd.138|Pd.18*

Research into tool steels

Anon. *Mech World* 1960 Vol 140 (3490) pp 189-190 (May)

D *Rwz.131*

Machine tools at the Swiss Industries Fair, Basle 1960

E. Mettler. *Microtecnic* 1960 Vol 14 (2) pp 70-74 (Apr)

A general article discusses, under various headings, developments evident in machine tool construction.

D *Pr.27.323*

How UK firm builds accuracy into grinders

A. A. Jones & Shipman Ltd. *Canad Mach* 1960 Vol 71 (4) pp 147-150, 208, 210 (Apr)

Methods employed in assembly of wheel-head and work-head spindles aim at machine accuracy.

11 illustr. *D* *Chc Pr.139*

Cross-Hatchings

Anon. *Cross-Hatch* 1959 Vol 11 (4) p 4 (Nov-Dec)

Reply to reader's question.

Continuing trials and experiments on diamond stick composition indicate that improvements over current results are forthcoming. Increased capabilities, plus reduction in manufacturing costs of diamond sticks, should serve to broaden the application of diamond honing not only in areas already familiar to honing, but also in the processing of some of the newer materials being developed.

D *Nqc.21*

Ceramic cutting materials. Keramische Schneidstoffe

H. Staudinger. *Werkstattstechnik* 1960 Vol 50 (5) pp 254-262 (May) (In German)

Different forms of the material, properties and working capacities are discussed. Examples are given of workpieces successfully machined by ceramic. It is explained that although ceramic tools are most satisfactory in certain fields, they do not by any means form a substitute for sintered carbide, HSS and tool steel tools. Further experiment is required. 19 illustr, 16 ref, 2 tables.

A *Pdb*Pdc*Pdd|Pdd.21*

Do hot pressed wheels mean higher speeds ?

J. E. Price. *Grinding & Finishing* 1960 Vol 6 (4) pp 34-36 (Apr)

Higher speeds have long been accepted as having greater efficiency than lower speeds. There have always been safety rules which were developed to control use of wheels in order to protect the user from the slightest possibility of injury. The hot pressed snagging wheels described here have indicated greatly increased savings and safety at speeds of 12,300 surface ft/minute.

2 illustr, 1 table. *X* *Cz Pe.21*

Using carbides with box tools

H. Frommelt. *S Afr Min & Engng J* 1960 Vol 71 Pt 1 (3505) pp 880-881 (Apr 8)

As a result of tests, it is concluded that productivity of stainless steel turning operations with box tools can be increased five times by replacing HSS tools with carbides. This increase can be doubled by using ceramic tools when interrupted cuts are not required. Much work will be required to overcome chip design problems. *D* *Ceqb Pdb*Ceqb Pdc*

PSG-6 BV precision surface grinder

K. Yamada, N. Nakayama, E. Ota. *Nagoya Kogyo Gijutsu Shikensho Hokoku* 1959 Vol 8 (8) pp 55-59 ; *J Amer ceram Soc* 1960 Vol 43 (5) p 105 (May)

The grinder was installed to test the characteristics of grinding wheels. The construction and characteristics of the machine are outlined.

D *Chcm Pr*

Optical instruments used in machine tool manufacture

E. Lepper. *Zeiss Werkzeits* 1959 Vol 7 (33) pp 71-76 (Sep) (In English)

15 illustr. *A* *Pr Qc Wc*

Seminar : ' Technical standardization and specialization of individual parts in machine construction '

Anon. *Standartiz* 1959 Vol 23 (12) pp 7-15 ; *Inhaltsverzeichnisse sowjet Fachzeits* 1960 Vol 9 (2) p 177 (Feb) (Original in Russian)

A *Pr Qb.255*

POWDER METALLURGY

Sintered carbide and oxide-ceramic cutting materials. Sinterhartmetalle und oxydkeramische Schneidstoffe

H. Haidt. *Industrieblatt* 1960 Vol 60 (4) pp 247-253 (Apr) (In German)

Deals with the development and production of sintered carbides and oxide-ceramic materials, discussing their properties and applications. Oxide-ceramic materials are not so tough as sintered carbides, thus limiting to some extent the range of application, but can be successfully used where short working times are required. 5 illustr, 4 tables.

K *Pdc|Pdd*

MISCELLANEOUS

Mechanisation and automation in the metal industry of the USSR. Mechanisierung und Automation in der Metallindustrie der UdSSR

Anon. *Zwetnyje metally* 1959 (6) ; abstr *Metall* 1960 Vol 14 (4) pp 342-343 (Apr) (Original in Russian, abstr in German)

A *Bf.25:.133.33*

Pictorial review of production on Herbert and factored machines

Anon. *Mach Tool Rev* 1960 Vol 48 (284) pp 32-61 (Mar-Apr)

105 illustr. *A* *Pr*

Fundamentals of numerical control

Ex-Cell-O Corp. *Metalworking Prod* 1960 Vol 104 (18) p 823 (May 4)

D *Pr Wpz.21*

ASTME 1960 Tool Show

Anon. *Tool Engr* 1960 Vol 44 (4) pp 121-192 (Apr)

Pictures and brief descriptions of tools representative of those exhibited in Detroit, April 21-28. Numerous illustrations are provided.

D *Pd.27.342*

Exhibitors at the Swiss Industries Fair, Basle 1960
Anon. *Microtecnic* 1960 Vol 14 (2) pp 75-93 (Apr)
33 illustr. *D* *.241.27.323.514*

The British machine tool industry
Anon. *Canad Mach* 1960 Vol 71 (4) pp 120-122 (Apr)
Figures are given for Canada's imports of metal-working machinery, 1948-1959, from the UK, US, Germany and other countries. 3 illustr, 2 tables.
D *Pr.25.321*

Canadian Machinery previews the 1960 International Machine Tool Exhibition, Olympia, London, June 25 - July 8
Anon. *Canad Mach* 1960 Vol 71 (4) pp 123-140 (Apr)
Alphabetically arranged reviews of exhibits, with numerous illustrations. *D* *Pr.27.321*

Putting electronic gages to work
F. W. Witzke. *Tool Engr* 1960 Vol 44 (5) pp 93-98 (May)
10 illustr. *D* *Wbbz*

Accurate measurements on machine tools by using optical reading instruments and precision scales
W. Moser. *Microtecnic* 1960 Vol 14 (2) pp 39-44 (Apr)
14 illustr, 4 tables. *D* *Pr Wp.139*

Lexicon of physics. Lexikon der Physik
H. Franke, Franckh'sche Verlagshandlung, Stuttgart. 1959, 2 vols, 2nd ed, illustr. Price DM 198.--. (In German)
The second edition gives detailed information concerning present achievements in magnetohydrodynamics, reactor physics and radiology, as well as covering more conventional fields of physics. The information contained in the first edition has been considerably expanded. The text is clear, well-illustrated and detailed enough to provide a reference work for both beginners requiring fundamental facts, and experts.
[Not in library of Industrial Diamond Information Bureau]. *A* *Vwg.523*

Safe storage of abrasve wheels
V. A. Broadhurst. *Mech World* 1960 Vol 140 (3490) pp 196-197 (May)
D *Pe.257.2595*

Development of machine tool building in China
B. V. Lenskii. *Byulleten tekhniko-ekonomicheskoi informatsii* 1959 (10) pp 78-81 ; *LLU Transl Bull* 1960 Vol 2 (5) pp 343-350 (May) (Original in Russian)
8 ref. *D* *Pr Qc.132.372*

PUBLICATIONS RECEIVED

BOOK REVIEWS

Scientific and technical publications of the Air Ministry [:] Micro-hardness tests and their applications. Publications scientifiques et techniques du Ministère de L'Air [:] Essai de microdureté et ses applications
H. Bueckle. Magasin C.T.O., 2, Avenue de la Porte-d'Issey, Paris 15e. 1960, 274 pp, illustr, bibl. (In French)
In the preface the author claims that his purpose in devoting his work to micro-hardness is as follows : to define the principle of micro-hardness ; to give an account of the actual possibilities and the limits of application of micro-hardness measurements ; to study the causes of error with a view to making more accurate measurement methods ; to give especially characteristic examples of the application of micro-hardness measurement ; to give an idea of the available apparatus and of the bibliography.
The work is divided into five parts, the first two providing definitions of the basic principle and the three different fields of hardness testing, and descriptions of the various types of apparatus. The third section is devoted to the technique of measurement, the various influences on results, the setting up of equipment and measurement of indentations. The fourth section concerns the laws of micro-hardness, and the theory behind the methods of measurement. In the final part, the author considers the applications of micro-hardness in the fields of technical examination of materials and scientific application. A bibliography is provided at the end, and an analytic table of contents at the beginning. It is a work for experts, well set out with good illustrations. *A* *Cvdb.52*

Guide for buyers—British engineers' cutting tools
The National Federation of Engineers' Tool Manufacturers, Light Trades Hse, Melbourne Av, Sheffield 10. [1959], 72 pp. Price 5s 0d
The Federation was formed in 1943, at Government request, to provide a co-ordinating body for the engineers' cutting tool industry. It provides a means for the exchange of technical information among its members and encourages standardization work at national and international level. The Federation consists of a number of affiliated associations each concerned with a particular type or group of tools ; these members and their products are listed here. Also provided are alphabetical lists of members of the Federation, of tools and of trade-marks. French, German and Spanish translations are given where necessary. The publication ends with giving British Standards relating to engineers' cutting tools.
D *Vwk.243.321.515*

Synposium on particle size measurement
ASTM Special Technical Publication No 234. American Society for Testing Materials, 1916 Race St, Philadelphia 3, Pa. 1959, 303 pp, illustr. Price $6.25
The papers delivered by authorities on the subject at the 62nd Annual Meeting of ASTM in Boston, Mass, are reproduced along with two additional papers on particle size measurement published by the Association. Different methods of analysis, application of methods and particular materials, particle size distribution, and measurement in the sub-sieve range, are the subjects covered. Photographs, graphs, diagrams and lists of reference accompany each paper, and a list of ASTM standards for particle size measurement is provided at the end of the book.
A *Vgf.541*

Engineering materials, machine tools and processes

W. Steeds. Longmans, Green & Co, London, New York, Toronto. 1957, 3rd ed, 426 pp, illustr, indices. Price 35s

This enlarged edition aims at providing students, apprentices, *etc*, with general background information on the basic elements of mechanical engineering other than design. The work is divided roughly into two parts. The first half deals with engineering materials, including testing and inspection, ferrous materials and non-ferrous alloys and the production of castings; the purely metallurgical side is covered only briefly. The second half considers machining processes, beginning with a general chapter classifying machine tools. Various processes, *eg* grinding and milling, are treated separately. Subjects are made more manageable by frequent subdivisions within chapters. Numerous photographs, diagrams and tables illustrate the text. A bibliography and references are given after many chapters and an index is provided. Among important additions to this edition is a description of ultrasonic techniques and equipment, and a chapter on contour copying. Standards are brought up to date.

D *B.52/Bf Cz.52/Bf Qd.52/Ceq.1456.52/Pr.52*

Deep drilling technology. Tiefbohrtechnik

G. Prikel. Springer Verlag, Vienna. 1959, 414 pp, illustr, indices. (In German)

Intended not only as a textbook for the student, but also as a practical reference book for the qualified engineer, this work deals with important factors affecting the success of deep drilling, including the materials which are available and their applications, and the various drilling fluids and their influence on drilling progress. Methods of determining the capacity of the yield and modern core-drilling processes are also discussed. The book is freely illustrated with drawings and photographs.

K *Cfb.1456.52*

TRADE LITERATURE

Macklin cylindrical grinding wheels engineered for the job

Macklin Co, Jackson, Mich. 4 pp, 8½ × 11 in., illustr

Two chief types of wheel are supplied: one of fused crystalline aluminium oxide abrasive for grinding materials of high tensile strength, and the other of silicon carbide for grinding materials of low tensile strength. Vitrified and occasionally resinoid bonds are used. Wheels are made up to customer's specifications. Recommendations as to the best wheel for each type of work are made. *A* *Chcl Pe.57*

Kentrall combination hardness tester

Torsion Balance Company, Clifton, NJ. 4 pp, 8½ × 11 in., illustr

Kentrall combination instruments perform both regular and superficial hardness tests. Four different models are shown: Model CT-1 is the smallest, used for work with sheet metal, small balls, wire, small parts, *etc*, and it can be used with a diamond spot anvil in the Superficial range and for soft material; Model CT-2 has a vertical capacity of 8 in. and Model CT-3 one of 12 inch. Model CT-4 is the largest standard model with vertical capacity of 16 inch. Ball bearing hand wheels, a Stedi-Rest adjustable accessory for testing parts with a long overhang, different types of anvil and the Jominy Fixture for the End Quench Test are features of interest on these machines. Test blocks, diamond cone indenters and a dial gauge are also illustrated in the catalogue. *A* *Wgh*

Durtal hardmetal tools

Vital Charpilloz, Moutier, Switzerland. 1 p 8¼ × 11¼ in., illustr. (In English, French & German)

An illustrated survey of the sintered carbide tools produced by this firm. All brands of cutting alloys on the market are used in the manufacture of Durtal tools. *K* *Pdc.57*

The HSW 63 D alternating current grinding and cutting machine. Drehstrom Schleif- und Trennmaschine HSW 63 D

Perles Elektrowerkzeuge u Motoren AG, Pieterlen/Biel, Switzerland. 1 p, 8¼ × 11¼ in., illustr. (In German)

Describes a hand grinding and cutting machine for concrete, *etc*, and for workshop use. The various wheels which can be fitted to the machine are illustrated. *K* *Chc Pr.57*

Collected catalogues

Reishauer-Werkzeuge AG, Zuerich.

The machine for truing worm grindings completes a workpiece in a sixth of the time spent on the initial grinding. The diameter of the workpiece may be between 270 mm and 400 mm and normal width is 62, 84 or 104 millimetres. Standard equipment includes, in the complete profiling set, a universal diamond truing apparatus with three pairs of truing diamonds.

The gear wheel grinding machine Type NZA/OZA gives better performance and has more uses than previous models. The grinding speeds are higher and a method of grinding in two directions is incorporated. Workpieces from 10 mm to 300 mm can be machined at speeds of 1875 rev/min for grinding and c. 100 rev/min for truing. Gear wheel grinding machine Type 2B is a larger machine, which will take workpieces up to 700 mm diameter. Worm gears are profiled on truing machine Type AM, which can be supplied as additional equipment.

A *Abmd Cg Nj/Ad Chc Pr.57*

Centring and control microscope ZM 1. Zentrier- und Kontroll-Mikroskop ZM 1

G. Troxler & Co, Optische Messapparate, Basle. 1 p, 8¼ × 11¼ in., illustr. (In German)

The use of suitable setting instruments on machine tools makes for easier working and greater accuracy. This instrument, it is claimed, enables the rapid and accurate setting up and centring of workpieces and tools. Other products are briefly discussed.

K *Wcm.57*

Aciera—general manufacturing programme

Aciera SA, Le Locle, Switzerland. 4 pp, 8¼ × 11¼ in., illustr. (In English, French & German)

Universal milling, drilling and tapping machines and semi-automatic machines are specified.

K *Pr.57*

Bidurit standard sintered carbide turning tools. Bidurit Hartmetall- Standard Drehwerkzeuge

Vereinigte Drahtwerke AG, Biel, Switzerland. 4 pp, 8¼ × 11¼ in., illustr. (In German)

K *Pdc.57*

Alesa high-efficiency tools. Alesa Hochleistungs-Werkzeuge

Ad. Leimgruber & Cie AG, Seengen, Switzerland. 1 p, 8¼ × 11¼ in., illustr. (In German)

Lists briefly the range of high-efficiency tools produced by the firm. Of special interest are the Alesa-Gold HSS cutters with sintered carbide inserts. They are produced in a range of from 90 to 500 mm diameter. *K* *Pd.57*

Agathon sintered carbide tool grinders and lappers. Agathon Hartmetallwerkzeug-Schleif- und Laeppmaschinen

Agathon AG, Solothurn, Switzerland. 1 p, 5½ × 8¼ in., illustr

These machines are used for machining sintered carbide tools, such as turning and planing tools, borers, and cutters. The characteristic feature of the grinding process is that the toolholder is passed from the preliminary diamond grinding wheel to the diamond lapping wheel, avoiding the need to re-set the tool.
K *Al Bkc Chc Pr.57/Al Bkc Chd Pr.57*

SFJ precision grinding wheel spindles, types AFE and AJFE with directly connected electric motor. SFJ Praezisions- Schleifspindeln Type APE-AJFE mit direkt gekuppeltem Elektro-Motor

E. Fischer AG, Herzogenbuchsee, Switzerland. 4 pp, 8¼ × 11¾ in., illustr. (In German)

Details of these grinding wheel spindles include tables giving directions as to the correct grinding speeds, *et cetera.* *K* *Chc Psl.323.57*

Survey of Oerlikon machine tools at the Swiss Industries Fair, Basle. Orientierung ueber die Oerlikon Werkzeugmaschinen an der Schweizer Mustermesse Basel

1 p, 8¼ × 11¾ in., illustr. (In German)

Gives details of a variety of lathes, drilling, grinding and milling machines. The HMS2 sintered carbide grinding machine intended for grinding and sharpening precision tools, especially those made of sintered carbide, is of special interest. Sensitive parts can be measured on the machine itself with the aid of an optical measuring device.
K *Pr.27.323.57*

Internal grinding machine No 6. Nr 6 Innenschleifmaschine

Voumard Machines Co SA, La Chaux-de-Fonds, Switzerland. 4 pp, 8¼ × 11¾ in., illustr. (In German)

Three variations of the machine are available : Type 6A is a fully and semi-automatic machine for grinding all types of series and has a truing diamond for differential measurement ; Type 6AP is similar, having an instrument for measuring penetrating bores in large series and either a truing diamond or a caliper pin for differential measurements ; Type 6AS is a completely automatic machine with a special work cycle. Table speed on all three is 0-10 m/min and spindle speed from 3,000 to 20,000 rev/minute.
A *Chc Pr.323.57*

A Norton diamond wheel, vitrified bonded for faster cutting

Norton Grinding Wheel Co Ltd, Welwyn Garden City, Herts. 4 pp, 5½ × 8¼ in., illustr

A table gives Norton wheel recommendations for grinding carbides. Both diamond and K Bond Crystolon Green Grit wheels are covered.
D *Bk Chc Nv.18.513/Bk Chc Pe.18.513*

Reishauer Universal thread and worm grinding machines Types US and UL. Reishauer Universal-Gewinde- und Schnecken-Schleifmaschinen Typ US und Typ U1

Reishauer-Werkzeuge AG, Zuerich, Switzerland. 4 pp, 8¼ × 11¾ in., illustr. (In German)

The machines are further developments of Type NRK, and can be fitted with automatic set-up of parts and semi-automatic truing process. In model UL, grinding and clamping lengths are greater than in the standard model US and it is equipped with hydraulically activated tailstock. A large number of attachments are available. *A* *Chcp Pr.57*

Superfix

Diametal AG, Biel, Switzerland. 52 pp, 6¾ × 9½ in., illustr

Superfix diamond grinding wheels are made with resin, metal, ceramic and electrolytic bonds, each of which is described. The grain sizes are given in accordance with DIN 848, and vary according to the work to be done : rough grinding with D 150, D 100 or D 70, medium grinding with D 70 or D 30 and finishing with D 15 or D 7. A table shows conversion from D numbers to micro-inch sizes, and equivalent British and American measurements. A further table shows the suitable grain sizes for different types of grinding on sintered carbide. The concentration of diamond is qualified by a special code of the company, 150 being the strongest and 30 the weakest. Recommendations are made for different purposes. Wet or dry grinding can be performed, but dry grinding means much harder wear on the diamond wheel. It is important to true the wheel as soon as the original shape is slightly deformed. Most of the wheels manufactured by this company are of natural diamond but synthetic diamond wheels can be provided. Specifications are given for all types of wheel, truing tool, diamond paste, and file.
A *Nv.57*

New Landis mechanical Micro-Swivel

Landis Tool Co, Waynesboro, Pa. 4 pp, 8½ × 11 in., illustr

The Micro-Swivel enables an operator to make exact movement of the swivel table on Landis cylindrical grinders simply and quickly.
A *Chcl Pr.57*

Philips diamond dies

NV Philips' Gloeilampenfabrieken, Eindhoven. 6 pp, 8¼ × 12 in., illustr (mimeographed)

Provides detailed data of hole profiles ; dimensions, tolerances and methods for checking ; electrical resistance check ; re-boring, maintenance and lubrication ; production (drawing copper) ; elongation and reduction ; and re-polishing machines.
A *Nkb.57*

Maegerle surface grinding machine. Maegerle Flachschleifmaschinen

Gebre Maegerle AG, Maschinenfabrik, Uster/ZH/ Switzerland. 14 pp, 8¼ × 11¾ in., illustr

The machine has hydraulic control of horizontal and perpendicular movement. The lubrication system provides a constant supply of oil film. An automatic grinding wheel mechanism can be used, the infeed of the grinding support being adjustable from 0.001 to 0.01 mm. There is automatic compensation for change in wheel size as a result of diamond truing or replacement by a new wheel. The diamond truing device is incorporated in the machine. A variety of attachments is available. *A* *Nj Psf:Chcm Pr.57*

Efag grinding carriage. Efag support Schleifapparat

E. Fischer AG, Herzogenbuchsee, Switzerland. 4 pp, 8¼ × 11¾ in., illustr. (In German)

The attachments are made in seven sizes of which detailed specifications are provided. External cylindrical and front face grinding, internal cylindrical and surface grinding, planing, truing and surface grinding of various tools and machine parts, grinding of grooves and indentations with thin wheels on hardened workpieces, and sharpening of normal turning, honing, drilling, milling and cutting tools, may be performed. Special attachments include an internal grinding pin and ream protector. *A* *Chc Pr.57*

Rihs—Universal tool grinding machine USM2. Rihs—Universal-Werkzeug-Schleifmaxchine USM2

Fritz Rihs, Pietterlen, Switzerland. 1 p, 8¼ × 11½ in., illustr. (In French & German)

Steel, sintered carbide and HSS tools may be ground and sharpened by this machine which is built, according to the catalogue, on new principles, performs as well as any model, and is unchallenged in price.

A *Chc Pr.57*

Nibru-Max universal milling, grinding and polishing machine. Nibru-Max - Universal- Fraes- Schleif- und Poliermaschine

Niederberger & Co, Lucerne, Switzerland. 4 pp, 8¼ × 11¼ in., illustr. (In German)

Stepless control from 1,000 to 40,0000 rev/min is an important feature of the machine. A belt grinding attachment may be used for grinding chrome steel, aluminium, and similar materials.

A *Chc Pr.57*

Chip-breaker grinding machine Type SNS

Revue Thommen Ltd, Waldenburg, Switzerland. 1 p, 8¼ × 11¼ in., illustr. (In English, French & German)

The machine will grind carbide-tipped tools with a shank profile of 30 × 70 mm and positive or negative chip angle up to 40°. Diameter and speed of grinding wheel are 100 mm to 6,500 rev/min respectively.

A *Al Bk Chc Pr.57*

Diamond drill bits—Catalogue No 173

Boyles Bros Drilling Co Ltd, 1291 Parker St, Vancouver 6, B.C. 12 pp, 8½ × 11 in., illustr

Specifications are given of all types of diamond impregnated drilling, coring and reamer bits.

A *Nh.57*

Gardner abrasive discs for every flat surface grinding job

Gardner Machine Co, Beloit, Wisc. 20 pp, 8½ × 11 in., illustr

A *Chcm Pe.57*

No 2 centreless grinder (Model LO)

Cincinnati Milling Machines Ltd, Birmingham 24. 20 pp, 8½ × 11 in., illustr

New features include infinitely variable regulating wheel speeds, pre-loaded precision ball bearing lower slide, stabilized infeed screw, pressure lubrication of regulating wheel spindle bearings, and, available as an extra, automatic balancing of the grinding wheel. These should lead to lower grinding costs and quality performance at speed. *E* *Chcc Pr.57*

CORRIGENDUM

See *Industr Diam Abstr* 1960 Vol 17 p A128 (May)
Crystal slicer : for *Mach Shop Mag*
read *Mod Mach Shop*

PATENT LISTS

BRITISH

The Official Journal (Patents) 1960 (3716) (May 4)

839,526 HALLEWELL, H. S. Forming apparatus for profile grinding wheels.

The Official Journal (Patents) 1960 (3717) (May 11)

840,517 HALIFAX TOOL CO LTD. Apparatus for grinding or sharpening rock drills, bits or like tools.

840,571 SACHS, T. Process for the manufacture of grinding wheels, disks and the like.

840,066 AUTOFLOW ENGINEERING LTD. Machines for grinding an edge on a plate of glass.

840,185 JONES & SHIPMAN, A. A. and HOULDSWORTH, J. Grinding machine wheelheads.

840,146 MERIT PRODUCTS INC. Abrasive wheel.

840,647 GESELLSCHAFT DER L. VON ROLL'SCHEN EISENWERKE AG. Grinding machines.

840,085 STRUNCK, H. J. Device for truing grinding wheels, particularly grinding wheels for grinding the level edges of spectacle lenses.

The Official Journal (Patents) 1960 (3718) (May 18)

840,770 GENERAL ELECTRIC CO. Diamond synthesis.

841,486 GEAR GRINDING CO LTD. Machine for grinding helical gear teeth on workpieces.

The Official Journal (Patents) 1960 (3719) (May 25)

842,023 EX-CELL-O CORPORATION. Device for form-truing grinding wheels.

842,170 KLINGSPOR, C. Rotary grinding units.

842,074 KLINGSPOR, C. Rotary abrasive member.

UNITED STATES

Official Gazette 1960 Vol 753 (1-4) (Apr)

2,931,145 O. E. HILL, NORTON CO. Grinding machine.

2,931,351 J. F. H. CUSTERS, H. B. DYER, P. T. WEDEPOHL, DE BEERS CONSOLIDATED MINES LTD. Polishing hard crystalline carbon.

2,931,630 D. J. GRADY, HYCALOG INC. Drilling bit.

2,932,087 J. R. MORRIS, F. E. HENNING, LIBBEY-OWENS-FORD GLASS CO. Template cutting apparatus for bent sheets of glass or the like.

2,932,130 H. L. BLOOD, R. A. QUIMBY, HEALD MACHINE CO. Grinding machine.

2,932,131 C. B. DE VLIEG, BLOOMFIELD TOWNSHIP, DE VLIEG MACHINE CO. Tool grinder.

2,932,133 H. J. ARMITAGE. Work forming apparatus and method.

2,932,136 G. M. TROTTIER, NORTON CO. Grinding machine.

2,932,138 E. E. FLUSKEY, H. U. BRUECKNER, REVERE CAMERA CO. Method and apparatus for manufacturing precision lenses.

2,932,925 E. T. DALTON, AMERICAN OPTICAL CO. Apparatus and method of forming ophthalmic lenses.

2,933,078 S. P. BRUCE, A. T. KOHLSTRUNK, WHEEL TRUEING TOOL CO. Continuous diamond infeed and grinding wheel dresser.

2,932,967 R. H. PREWITT, M. LARSON. Scratch strain recorders.

2,933,858 A. C. GLENN, A. H. DALL, CINCINNATI MILLING MACHINE CO. Surface grinding machine.

2,933,865 K. MILLER, ALLBRIGHT-NELL CO. Knife sharpening apparatus for rotary knives having involute contours.

2,934,057 A. WEINING. Grinding wheel dressing device.

2,934,327 W. H. LEWIS, CUTCRETE MFG CORP. Concrete sawing machine.

SOUTH AFRICAN

Official Journal 1960 Vol 13 (12-15) (Mar-Apr)

624/59 N. C. POPE, HARD METALS LTD. Drill bits with inserted cutting formations.

AUSTRALIAN

Official Journal 1960 Vol 30 (8-12) (Mar-Apr)

226,971 HUGHES TOOL CO. Tunnelling method and apparatus.

SWISS

Patentliste 1960 (5-7) (Mar-Apr)

345,091 G. W. OYLER, J. MAIER III, UNION CARBIDE CORP. Method of removing metal from a workpiece of stainless steel or from a non-ferrous metal.

345,092 E. H. CARMAN, BIRMINGHAM SMALL ARMS CO LTD. Method of machining a workpiece by electric sparks and machine for carrying out the method.

345,160 L. NUSSBAUM, TITANIUM PRODUCTS CORP LTD. Method of producing carbide-containing hard metals.

345,226 L. O. CARLSEN, A. H. KRASTEL, GLEASON WORKS. Machine for cutting gear wheels.

345,400 J. L. ADCOCK, WICKMAN LTD. Method of drilling a hole of small diameter by means of electric sparks.

345,459 C. A. ZALUD, TITAN ABRASIVES CO. Abrasive body.

345,558 H. E. BALSIGER, LANDIS TOOL CO. Grinding machine.

345,604 R. NARDIN, U. NARDIN, SA MANUFACTURE DE MONTRES ET CHRONOMETRES, BATORI COMPUTER CO INC. Chronometer.

345,623 J. DIONISOTTI. Drilling tool.

345,786 L. O. CARLSEN, A. H. KRASTEL, H. A. MALE, GLEASON WORKS. Machine for producing toothed workpieces.

FRENCH

Bulletin Officiel 1960 Vol 1 (14-17) (Apr-May)

1,227,965 VIS (VETRO ITALIANO DI SICUREZZA). Automatic machine for grinding glass, in particular for manufacturing large series of automobile windscreens or the like.

1,227,771 W. K. VAN ORMER, CARBORUNDUM CO. Paper coated with abrasive material.

1,227,970 INSTITUT DR ING REINHARD STRAUMANN AG. Method of manufacturing a bearing for spindles in watches and measuring instruments.

1,227,272 A. BOURGEOIS. Machine for grooving spectacle lenses.

1,228,210 SA DES MANUFACTURES DES GLACES ET PRODUITS CHIMIQUES DE SAINT-GOBAIN, CHAUNY & CIREY. Method and devices for making holes of very small section.

1,229,583 G. J. LEGENDRE. Cooling of cutting tools.

1,229,346 ZAHNRADFABRIK FRIEDRICHSHAFEN AG. Device for truing profiled grinding wheels for grinding pinions with helical involute teeth.

1,229,463 T. W. GLYNN, AMERICAN SAINT-GOBAIN CORP. Method and apparatus for drilling holes of large diameter in sheets of glass.

1,228,941 W. TIRASPOLSKY. Tool for earth drilling.

1,230,260 O. NIEDERHOFF, DEUTSCHE EDELSTAHLWERKE AG. Method for the spark machining of workpieces.

1,229,787 J. A. PELECQ. Arrangement for the cleaning, recovery and distribution of abrasives.

1,230,164 J. PERTHEN. Method and device for testing surfaces and profiles of a machined workpiece.

GERMAN

Patentblatt 1960 Vol 80 (15-18) (Apr-May)

Applications Open to Public Inspection

1,079,799 A. KNAFF, H. -J. PANTEL, SIEMENS-SCHUCKERTWERKE AG. Cutting apparatus for plate glass produced as a continuous ribbon.

1,079,924 M. ELTRICH, ZAHNRADFABRIK FRIEDRICHSAFEN AG. Grinding device for longitudinally convex gear wheels.

1,079,989 K. BERSTECHER, D. MUNTZ. Artificial resin or ceramic bonded abrasive body.

1,080,432 H. -O. SCHMIDT, HERMINGHAUSEN-WERKE GmbH. Method of truing grinding wheels in dependence on vibrations produced when the tool becomes dull.

1,080,433 W. OSENBERG. Method and device for regrinding or profiling of grinding means, in particular of grinding wheels and bands.

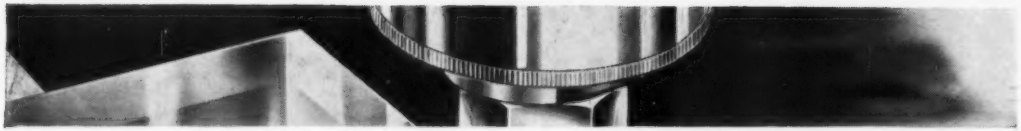
1,080,434 C. KRUG, DISKUS WERKE FRANKFURT/MAIN AG. Individual grinding body, in particular face grinding wheel.

1,081,293 H. SCHUMACHER, W. ROESSGER. Method and device for the chip producing machining of workpieces as by a grinding or shaving process.

1,081,341 H. E. BALSIGER, LANDIS TOOL CO. Machine for copying grinding convex surfaces, *eg* on turbine blades.

LITERATURE REQUESTS

Please quote the page number of the Bibliography containing the original reference, and the author and title of the article, in all cases.



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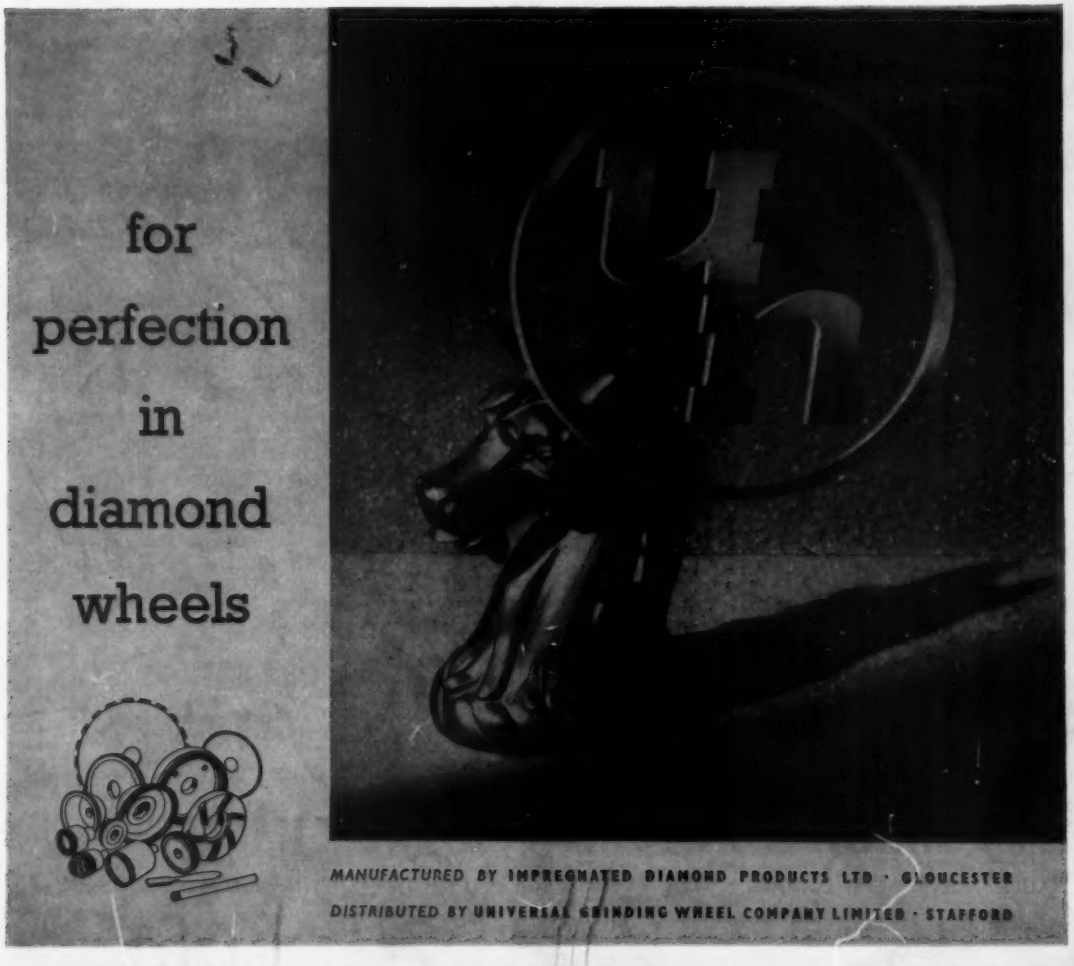
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